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I. The Nature of Certainty. A. K. ROGERS

II. The Mechanics of Intelligence. HOWARD C. WARREN

III. Phenomena and Their Determination. GRACE ANDRUS DE LAGUNA

IV. Professor Husserl's Program of Philosophic Reform. ALBERT R. CHANDLER

V. Reviews of Books: *A. Seth Pringle-Pattison*, The Idea of God in the Light of Recent Philosophy: by Ernest Albee—*John Elof Boodin*, A Realistic Universe: by R. A. Tsanoff—*Wilhelm Wundt*, Elements of Folk Psychology: by H. N. Gardiner.

VI. Notices of New Books

VII. Summaries of Articles

VIII. Notes:

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THE PHILOSOPHICAL REVIEW

CONTENTS FOR NOVEMBER, 1917

PAGE

The Nature of Certainty . . . . . A. R. ROGERS 585

The Mechanics of Intelligence . . . . . HOWARD C. WARREN 602

Phenomena and Their Determination . . . . . GRACE ANDRUS DE LAGUNA 622

Professor Husserl's Program of Philosophic Reform . . ALBERT R. CHANDLER 634

Reviews of Books 649

A. Seth Pringle-Pattison, The Idea of God in the Light of Recent Philosophy: by Ernest Albee—*John Elof Boodin*, A Realistic Universe: by Radoslav A. Tsanoff—*Wilhelm Wundt*, Elements of Folk Psychology: by H. N. Gardiner.

Notices of New Books 670

Door C. Pekelharing, Kant's Teleologie—*Th. Flournoy*, The Philosophy of William James—*Edwin B. Holt*, The Freudian Wish and Its Place in Ethics—*Brother Chrysostom, F. S. C.*, Development of Personality.

Summaries of Articles 675

Albert Sechehaye, Les problèmes de la langue à la lumière d'une théorie nouvelle—*E. Crawshay-Williams*, The International Idea—*J. W. Scott*, Bergsonism in England—*Norman Wilde*, Rousseau's Doctrine of the Right to Believe—*Dr. Grasset*, L'idéalisme positif—*Gustave A. Feingold*, The Present Status of the Unconscious—*A. Espinas*, L'idée initiale de la philosophie de Descartes—*A. Portuondo*, Principes fondamentaux pour la sociologie mécanique—*Charles E. Hooper*, The Meaning of the "Universe."

Notes 684

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THE PHILOSOPHICAL REVIEW.

THE NATURE OF CERTAINTY.

I AM setting out to inquire what we mean by *certain* knowledge, and under what conditions, if any, we may expect to secure it. The question has sometimes been put as a question about *necessary* knowledge. It is not obvious, however, that necessary and certain mean the same thing; and I may therefore start by considering 'necessary' truth. This is a term which plays so important a part in philosophy that many philosophers refuse to call anything knowledge which falls short of it.

The most obvious meaning of necessity is that of formal logic. Certain propositions, namely, are found to involve as part of their meaning another proposition; and the last then is logically necessary, in that, so long as we hold the premises true, and keep our meaning unchanged, we cannot possibly deny it. Practically, of course, we are often able to deny things that logically we are bound to accept, because we can refuse to see the identity involved; we either forget all about the premises while we are denying the conclusion, or we hold our ideas so loosely and vaguely that we hardly know just what we do mean, or we slip inadvertently into a different, though a definite, meaning. There is nothing to prevent a man from doing any of these things if he chooses, except the fact that by so doing he sets up different rules of the argumentative game from his fellows, and thus loses the advantages of success in argument. But when he really takes the trouble to realize clearly his own meaning, he finds it impossible to refuse to assent to the claims of logical necessity. If he sees

that the meaning of his conclusion is identical with a meaning present in what he has already accepted, he would have, otherwise, to assert and to deny the same thing at one and the same moment; which, since assertion and denial are incompatible attitudes, is a physical before it is a logical impossibility.

So far, however, we have not met the demands of our everyday notions of truth. For the necessity is one of inference only, of necessary *connection;* it is hypothetical necessity; and it tells us nothing of the truth value of the situation as a whole. If the premises are true, then the conclusion necessarily follows; but the truth of the premises must be settled on independent grounds. Of course a way may be found of deducing them also from further premises. But this process needs must have an end; somewhere we must get to original sources of belief. Granted that we have belief to begin with that goes back of logical implication, such belief may be indefinitely strengthened by a logical connection with other beliefs; but without such a foundation to build upon, systematization gets us no further forward. We can add any number of zeros together without getting the number one. A man clever enough, and with sufficient time on his hands, could form conceivably a great many complicated and ingenious systems out of the same data, which might nevertheless all alike be totally 'unreal.' Somehow the system has got to be tied down by the fact of belief if we are ever to call it 'true.'

There is, however, a second meaning of the word necessary which would, if it could be established, carry with it a more significant philosophic result; and indeed it has been used as one of the main foundation stones of a very influential philosophy. The essence of the claim is this, that there are certain truths about the constitution of the world which we are forced to accept because they are implicated in the very nature of reason, and have, therefore, to be used in any rational argument whatsoever, even such an argument as attempts to deny them. They are necessary, then, in the sense that they are needed for the exercise of rational judgment; and since, if we were to abandon reason, we should be excluding ourselves from the sphere in which truth and falsity have meaning, we are justified in claiming them as

'necessary' truths. In a way they depend on the 'self-evident' truth—I shall speak of self-evidence later—that two contradictory propositions cannot both hold good, but not in the sense that they can be 'deduced' from this; rather they offer an *instance* of contradiction, but an instance which gets its philosophical significance from the peculiar fact that of the two contradictories, one gets decisively the upper hand through our inability to think the other consistently without presupposing it. Concretely the truth here usually reduces itself in the end to the proposition that reality is a 'rational whole.'

Before considering this claim briefly, it is well to have before us what in plain terms it amounts to practically. Since reason is an empty term unless it means the particular rational structure of our human ways of judging, or our human 'minds,' what it asserts is that I can be perfectly certain—not merely practically confident—that what *my* reason—*qua* human being—tells me is the nature of the world, must actually be its nature—that I cannot on a grand scale be mistaken. Now when such a proposition is presented to me, it fails to make any immediate impression of certainty on my mind. Indeed, the proposition that reality, conceived as transcending human experience, must—not does—conform to my mind, seems to me when I examine it on its merits distinctly doubt-provoking. The doubt is not purely academic, but is based upon positive reasons for holding that my mind may lead me into error; and I can easily imagine circumstances —in terms, say, of Descartes's devil—which theoretically would make such error thoroughgoing. While I am occupied with it I may find the idealistic argument plausible, and hard to refute. But when I begin to reflect, first on the general dangers which I know attend argument, and then on the nature of the proposal itself which I am asked to believe, I do actually find my confidence wavering. My state of mind at best is less a whole-hearted acceptance of the result, than an admission that I fail to find any flaw in the reasoning. And what is the good of a belief in certainty unless the belief itself is certain? A practical drawback in such a philosophy has always been found to be, that it sets a demand which it is impossible to satisfy in the concrete. What

we are really concerned with is beliefs about the nature of the world in particular. Very few idealists have been bold enough however to claim that the details of their philosophy are indubitable; at most we are left with the general claim for rationality, while the particular form which this takes is open to philosophic dispute. And if even the general claim is successful in maintaining its standing only as we keep going over the argument, it would seem to present little more than a curious interest. I might add the doubt that is bound to come from the fact that other philosophers, some of them better men than myself, fail to see the force of the argument. The existence of a conflict of expert opinion need not be serious in the case of what is admittedly probable opinion; but it is a not unimportant matter for the claimant to infallibility.

Now it is to be granted that there is one presupposition under which the conclusion does appear to follow. If 'reality' is identified with the 'content of knowledge,' taken as mental or rational content, then it seems to be a necessary consequence that reality follows the laws of reason. The content of reality is just a content of reason, and of course cannot violate its own nature. If you assume to begin with the thing to be established —the validity of the idealistic conception of reality,—the assumption will naturally contain within itself the desired conclusion; but such a line of proof has commonly been frowned upon by the logic books. And it seems possible to evade the argument if we start with a different assumption, and make truth consist in a correspondence between an intellectual content, or an ideal set of characteristics, and a further reality to which this is referred. To say that reality is irrational would then have the meaning that if I could—which I cannot—absorb reality into my experience, I should find that it does not meet the expectations represented by any content that my rational mind is competent to form. This seems to me an intelligible statement; to deny that it conveys a meaning has itself very much the appearance of a violation of the laws of thought. I can, it would seem, think of the possibility of something which is non-rational, for I am at present talking about it, and my adversary is refuting me on the

assumption that he knows what I mean. To turn about now, and say that the thought of the non-rational is itself a thought of the rational, since it is a thought, seems a little like verbal juggling. How can I mean the same thing at the same time by the rational and the non-rational? And if I can think of a non-rational reality, what becomes of the impossibility that it should exist through the impossibility of thinking it? Certainly the situation is a curious one. We have an idea, and then suddenly we find that we haven't it at all, but a quite different idea instead; so that we face the alternatives, either that the idea of the non-rational is possible, in which case no argument can prove it impossible, or else that we are mistaken in thinking that we ever had the idea at all, which seems to make nonsense of our whole discussion.

What really is self-evident is, of course, not that the thought of the non-rational is the thought of the rational, but that the thought of the non-rational is a rational thought, which is an altogether different thing. This to be sure implies that there is a distinction between thought and thing; but the distinction once admitted—and its *impossibility* does not seem plain—what becomes of the argument? Once more, the point is that in thinking of reality I must follow the laws of thinking; but why should this mean that reality must follow the laws of thinking? I cannot, it is argued, say that it is true that reality is irrational, because in calling it true I am implying that reality is following the laws of truth, and therefore cannot be irrational. But in point of fact I am not applying the word 'true' to reality, but only to the judgment; the reality *is*, and that is all. If I were to say that reality is irrational, and also that at the same time I can know concretely wherein its irrational character consists, then I grant that I should be contradicting myself; but this of course is not what I am saying. And why there might not be a portion of reality so constituted with standards of its own that, by the use of them, it should be able to think the possibility of other reality such as does not meet the same standards, I fail to see clearly.

To all this it may perhaps be replied that in drawing a dis-

tinction between reality and the knowing process, we are overlooking the fact that after all my reason works always upon the real world as its material, and refers to it; and that this carries with it the impossibility that *reality* should be self-contradictory, and not merely the conclusion that *I* cannot logically contradict myself. And I am willing to grant that this is so; but only in a sense which seems to me not identical with the demands of the idealistic argument. I should agree that we find ourselves unable to doubt the rationality of the world, in so far as this means that it is literally impossible for us to hold two contradictory beliefs about reality when we once see them to be contradictory,—the belief, for example, both that an object is white, and that it is not white, in the same sense; and so to this extent the law of contradiction holds of *things*, and is not merely a 'mental law.' But so long as the possibility exists of withholding belief from *both* the two assertions, it at least fails as a source of any knowledge *in particular* about the world. It is true that, though without having to make a choice, I am forced to the abstract conclusion that one *or* the other of them must be accepted. I cannot, in other words, believe the world to be strictly irrational, if this signifies some character attaching to it that would correspond to the exercise of my reason in the way of assertion and denial simultaneously. But I can very well conceive that it may be *non*-rational, implying simply that it may not be what concretely my human way of viewing things leads me to think it is. Of course, as I say, even the outright denial of all positive claims to knowledge leaves us with this minimum of accepted truth, that reality *is not* so and so; while a more cautious scepticism would at least have to admit that it is one thing *or* the other, *either* as we think it, or existing in some different way. But *this* is a sort of truth which it is equally unimportant for agnosticism to avoid, or for rationalism to defend. To say that a thing is *not* of a certain sort hardly gives us, except sometimes as a practical reason for our right to neglect it, any important information about it, unless—what is not here the case—it means the exclusion of one of a definite number of known possibilities. And the negative alternative is logically conceivable as against

any and every claim to positive knowledge. Strictly speaking, then, it would appear that the law of contradiction is concretely a decisive factor only when it is a question, not of the nature of reality, but of the *consistency* of our beliefs and reasoning processes. Its function is to tell us, not that any belief must be accepted as true, but that certain beliefs must be rejected, because they are not consistent with something else that, for independent reasons, we are unwilling to give up; or, more particularly, that certain *arguments* are invalid, because they make use of the assumptions which it is their outcome to disprove. It is a weapon of critical attack, and not of construction. At best, therefore, all that it can do in the present case is to convict of inner inconsistency the argument of the man who sets out to prove by reason that the world *must* be irrational, since 'must' is a rational term. But it cannot lead us to reject necessarily an hypothesis of non-rationality, because what this involves is, again, not the assumption that for *thinking* absence of contradiction is not necessary, but that to *existence* the conditions which give rise to knowledge *may* fail to apply.

I conclude, then, that except for the purely formal truth that reality cannot combine strictly contradictory predicates—implied in the practical limits attaching to the possibilities of 'belief'—there is no such thing as a necessary truth that is ultimate, and that necessity always presupposes some non-necessary background.

For the act which gives us our starting-points of belief, I shall use the name intuition. The word has had various meanings in philosophy; I shall mean by it any act which involves the immediate acceptance, in the way of belief, of some datum of knowledge which does not get its credentials through its connection with other data. That there are such beliefs which we accept prior to any recognition of their necessity or logical ground—even though afterwards we may try to bolster them up by further processes—is clear enough. Not all of these intuitions are to be regarded as *certain* knowledge; but when they *are* held to be certain, they are accepted not because they are necessary, but because they are *self-evident*. And by self-evident I shall mean

this: that I find it impossible, even in imagination, to think of myself as conceivably in a state of mind where I should consider the proposition open to doubt, the ground of my assurance lying within the proposition itself. I add the last clause, though I suppose it is hardly required. Assurance due to strong emotion or desire, which is one of the forms of 'intuition' it is intended to exclude, could hardly be brought under the definition anyhow, for it is always possible, and usually easy, to imagine myself not ruled by this desire. So, also, if the confidence is due to the backing which the belief has from other and related beliefs, I shall hardly find it impossible to imagine myself not believing it. I may find myself unable to imagine anybody's belief refusing to be called forth provided he accepted as true all the evidence that is now before *me;* but since the certainty attaches to the belief not in its own right, but by virtue of something else, and since I can very well imagine these facts otherwise, or new facts added that would change the whole situation, belief here can hardly go beyond *practical* certainty.

Now my thesis is, that the foregoing definition of 'self-evidence' will be found to apply solely to judgments about the content of present experience, or experience immediately past. This will include truths of two somewhat different orders,—first, assertions of the psychological *existence* of states of consciousness, or facts of immediate experience, and, second, and for practical purposes more important, assertions that such and such is an accurate *description* of the intellectual content, or meaning, which at the moment I have in mind. That some judgments in this field can attain self-evident certainty, is Descartes's starting-point in philosophic method; although Descartes, by failing to distinguish the two forms of judgment, and, in particular, by adding to the second of them a further and arbitrary assumption of independent existential import, obscured the nature of his own procedure.

To interpret this thesis, a few words of explanation are called for, though these presuppose rather more in the way of a theory of knowledge than can at present be substantiated. Ordinarily we know things indirectly through the medium of ideas, or mental

states, which alone are present bodily. Physical objects that are spatially present to the organism are 'known' only by means of their effects in consciousness; and all objects whatever that are spatially or temporally removed, are represented in knowledge by 'ideas' in the narrower and more literal sense. And on such terms certainty is out of the question, since we never are able to rule out the chance that things not existentially present may be inadequately represented by our ideas of them. Until we recognize this element of possible error, we may uncritically accept a belief as self-evident; and even after it is recognized we may still remain *practically* assured. But theoretically we are bound to admit that this assurance is subject to discount, and so the instance falls outside the definition. In the nature of the case the definition can hold only of an object of belief that is literally, and in its own person as it were, within the knowing experience.

Now this I find conceivable only on one condition. If a present fact of conscious experience may not only *be*, but if also we can give immediate *attention* to it, and bring it into the focus of consciousness, it would seem possible for us to know directly both *that* it is, and *what* it is, without the intervention of ideas, and so theoretically to be able to be certain about it. There would be only two limits to this. The first is the limit of the range of clear attention; what lies beyond this is subject to theoretical doubt even as a present fact of experience. And for sense content, at least, this may be the only limit. When a sensation is held automatically constant by the continued presence of its producing cause, we seem able to attend to it, or be immediately aware of it, at the very moment of its conscious existence. Thus if we simplify the sensational field sufficiently, and give heed, say, just to a patch of color, we have an immediate sense that while it lasts this *is*, and is just what it is, in a way to make any expression of doubt seem to us quite meaningless. In other instances, however, the conditions which give rise to the experience are not so stable, and are displaced by the act of attention itself; then there is a second limit. But if we can get the fact of experience on the wing, before it has had time to fade away, it

still belongs essentially to the 'present moment'; and certainty is equally attainable.

But now there is an obscurity here which still needs to be removed. Although I have said that I may be certain under the conditions described, these hardly as yet are quite consistent with the definition of self-evidence. This last implicitly involves a conception of 'truth'; and, as I have just implied, the only way I am able to define truth for myself is in terms of a correspondence between idea and reality. If then the situation is such that the object is present in person *without* the mediation of an idea, how can we speak of a judgment that is self-evidently true?—for I suppose the phrase is applicable only to a judgment. Now I should admit the point of such a criticism. Though in a sense any content of which I am aware *is* just that content of which I am aware, and is recognized as such, the self-evidence that, intellectually speaking, justifies certainty, is not the bare recognition, but a question of the *truth of a judgment*. And I should hesitate, in spite of having spoken of it as a 'known' fact, to call the immediate conscious awareness of red a judgment, or a truth. It still seems to me that we can speak of a 'true' judgment only where there is duality involved, and a reality is accepted as corresponding to an 'idea' of it. And I should reconcile the apparent discrepancy by holding that an immediately known fact becomes a 'truth' only when we pass a secondary judgment *about* it. In strictness, the truth is not the immediate recognition of the content, but *that* it is *as* recognized. That a given intuitional judgment is true means, then, that a given description of the content is a correct one,—that I was not mistaken or confused in my analysis, and so that the statement does really represent the fact. And the testing of truth is dependent on our ability to repeat the analysis or inspection, and so scrutinize the—immediately known—fact to see if anything has been attributed to it which was not actually there. On this reexamination, accordingly, the possibility of rational certainty depends. An introspective *judgment* may plainly be inadequate; and therefore it should not set up too hasty a claim to self-evidence, since no single judgment which stops with itself has any way of being

assured that it may not be among those judgments which *seem* to be true, but are mistaken.

And all intuitional truths capable of certainty appear to me to be of this sort. They are statements of what we actually discover to be the nature of our mental content at the moment; and they are self-evidently true statements in so far as they continue to seem with entire clearness an accurate description after repetition and the closest scrutiny we can give. Not every description of content by any means is self-evident; and there seems no way of ruling off a definite sphere within which self-evident truths lie. But in some cases the thing is so extremely clear that we refuse to admit even the bare possibility of mistake. An element of content has, however, to be relatively simple for this maximum of certainty to exist—how simple depends both on the nature of the circumstances, and on the familiarity, expertness, and mental grasp of the person judging. Of course it is theoretically open to conceive that I may be mistaken in my use of *words;* but the content whose identity I am really conscious of meaning by the word is indubitable, because the thing that I am aware of is just what it is and nothing else. If I compare a red and a green patch of color, and make about them the judgment that they differ, I feel absolutely sure that when the judgment does not pass beyond a description of my perceptual content, I cannot be wrong. The judgment simply identifies a relationship at the moment present to me.

I have remarked already that for philosophical purposes the important truths here are concerned not with the 'that,' but with the 'what,' of our conscious contents. I may add that among our meanings, the more significant have to do not with 'qualities,' or the more substantive phases of thought content, but with 'relational' ideas. Now to this last category belong, as I see it, all axioms, as the word has traditionally been understood. These represent primarily descriptive truths about our intellectual content, or meaning. If I say that two straight lines cannot enclose a space, I see no ground for this except—and it is a quite sufficient ground—the immediate perception I have of the nature of my experience when I envisage a spatial field, and

the felt incompatibility between the two sets of conditions. That things equal to the same thing are equal to each other, depends, again, on a direct perception of the lack of difference under the conditions described; I cannot doubt it when I once realize the exact character of my meaning in the judgment. Here belongs, it should be noticed, logical necessity. This rests on the immediate perception that a certain matter of content is actually present as a part of my meaning in previous statements; and the 'principle' of deduction is just a generalization of the situation thus directly perceived.

If accordingly we continue to talk about the self-evidence of an axiomatic truth, it is of course essential that we confine it to these narrow descriptive limits, and do not extend its application unduly. An extension might take either of two forms,—that the perceived relationship *always holds*, or that it holds *of* a reality. The first claim, of universality, when it is legitimate, depends simply upon the will to keep our meanings fixed, and allow no conditions to enter except those under which we perceive the self-evident relationships. If I discover something true about the angles of a triangle, I believe that it will follow always, and not merely in the particular case where it was demonstrated, in so far as I can count always on the same circumstances as those which were essential to the demonstration; the only need I have of additional examples is to establish my conviction that the necessary conditions *are* in reality no more and no less than triangularity. I could, if I chose, adopt the same attitude toward *all* propositions, and make them universal by the simple device of giving fixity of meaning to my words. This however is puerile, and represents no scientific practice. And it calls attention to the second point, that whenever truths profess to go beyond a description of the meaning implicit in our mental content, and to refer to things, an unavoidable element of uncertainty comes in. The assurance of an independent world of existence may be intuitive in the sense that it is simple, immediate, and strongly self-confident; but it never can be *self-evident*, simply because, as such a world never comes in direct contact with its description, I can conceive myself mistaken in my reference.

So geometry is certain only while it confines itself to the abstract world of space relationships. However strong my assurance that it truly applies also to the existent world of things, this rests upon an assumption, and is not self-evident. Mill has been the object of much scorn for his suggestion that two and two might possibly make five; but taken as apparently it was intended, I see nothing against the supposition. It is quite conceivable that the world might be so constructed that whenever to two things another two were added, five things would at once appear; this is in principle the sort of thing that does happen regularly in the conjuror's world. When it comes to the question how things actually will work, then the theoretical possibility of a new and totally surprising result will always have to be admitted.

The only thing that seems seriously to complicate the foregoing account, is the case of those necessary truths which appear not to be directly present in the premises, but which come as a new and unforseen discovery. In formal deduction nothing new can come out of the premises; whereas in mathematics, for example, we are constantly advancing to truths that are a surprise and revelation to the discoverer. But how could the truth be tucked away where no examination of the postulates could detect it? and if it was not there, how does it come about that I am able to make the discovery by an intellectual process without appeal to new experience?

I am compelled to confess that when the modern logician begins to talk about the 'activity' of propositions, and their power to 'generate' facts or truths, I am unable to dispel a sense of mystery and unreality; it suggests a sort of universe quite unfamiliar to my natural thought. The best I can do is to attempt to translate such statements into language which I can hope to understand, while recognizing that thus I may all the time be missing the point.

Now in the categorical proposition I can discover nothing whatever in the way of active power; anything that we can get out of it was already there at the start. With the hypothetical, the case is a little better; there is a sense in which here the proposition might perhaps be regarded as a source of something

new. Put in the form—if A, then B,—I might, that is, be enabled, if I can identify some object as a case of A, to infer that it also is B; and if the object had never before been recognized as a B, I have in a sense added to my knowledge.

But now what does this really mean? Obviously if acquaintance with the universality of the connection depends on my having examined all the cases, the new instance cannot really be new after all. If, on the contrary, it is due to an abstract connection of logical characters anterior to experience, there are various possibilities. The connection may be one found as a matter of fact to exist in certain instances, and then more or less confidently looked forward to in others; in that case we have in the proposition nothing more than a useful method of investigation, the novel truth depending not on the logical procedure, but on the experience which verifies the hypothesis. Or the connection, instead of being empirical, may be a *necessary* one. But the only kind of necessary connection I know is that of logical necessity,—where, namely, the connecting bond is no more than a relational fact within a logical whole freely postulated. But in that case I have no right to reason to an individual real instance, which may or may not exemplify this logical connection, and which again, therefore, is guaranteed, if at all, not by logic, but by experience.[1] And the only remaining alternative I see is to fall back on the process of arbitrary universalization, and interpret the proposition—if A, then B—as a rule of procedure, to the effect that when I meet a case of A, I am to act according to a predetermined formula, and *call* it also B. In other words, my proposition now stands for a plan of action, something that I propose to *do*.

Now as a matter of fact in this last suggestion we apparently have, in essence, the sense actually attaching to the logician's claim that propositions are active, and generate new truths. Strictly it is a case of *my* being active, along lines marked out by a formula which the proposition contains. And that in this way

[1] Even if the particular instance were conceived to be constrained by the logical bond, it still would present no new *logical* truth—which is what we supposedly are after,—but only a factual truth reduplicating the same logical connection with which we started.

new truths may emerge need not be denied; though what it is that makes this possible calls for elucidation.

And one source of novelty here lies very much on the surface; the new truths may be discovered by fresh *intuitions*, and not by logic at all, though the conditions governing the exercise of intuition may be set by rules that are logical in their nature. Suppose I set out to count all the red-headed people I meet on the street, or all my acquaintances whose names begin with A. The result may be said after a fashion to depend upon a plan of action, or 'proposition,' which 'generates' it, while still representing a new bit of knowledge not actually contained in the 'premises.' But it also is evident that the act of counting would be empty, in spite of being limited in the abstract to a predetermined field, were it not on the one hand for a world of reality presupposed by, but not in any sense contained in, my formula of action, and, on the other, for the specific acts of perception through which it furnishes me the material of counting. Or better, perhaps, take the novelist who, starting out with a certain type of character in his mind, finds himself watching it unfold 'of itself' as it comes into contact with imaginary situations. This is an illustration which the logician himself sometimes uses as comparable with mathematical 'generation,' and it has a certain advantage in that one need not be overawed here by the presumption of a special insight not shared by the uninitiated. And the explanation, again, is fairly evident. We start, say, with the presupposition of egotism. With just the abstract notion to go on, and no concrete knowledge of the world in detail, we should stop where we began; but assuming the requisite knowledge of life, and then setting a principle of action to work under definite surroundings, in the contact of motive and opportunity new relationships are revealed, and the mind finds itself perceiving them, and following them to a conclusion that may well have been unanticipated at the start, though when it emerges we recognize it as convincing and 'necessary.' And the same thing may take place in a more abstract realm, where intuition means not the imaginative perception of facts or happenings, but the recognition of bare relational contents. Thus the mind can operate

on space qualities apart from physical experience, and by spatial constructions put itself in a position to intuit new relations; but while in a sense these are dependent on the constructive process, in another sense this process is merely a road to the independent discovery, by an act not logical but immediate, of facts about spatial reality. Grant that relationships have some sort of being prior to their discovery—which I am ready to admit, —then in so far as in *any* field an active process leads us to the collocation of material wherein the mind can perceive relationships, you have the chance of novelty. But it is because intuition as well as logic is involved; logical necessity remains nothing more than the non-productive thing it is for formal logic. Even if the material is itself created by the act, as, apparently, in counting, this only means that acts are a part of the matter of reality, so that they offer stuff for the mind to work upon.

Apart then from an assumed field of reality in the background which supplies material for knowledge, have we any other source of 'novel' truth? I do not know where we could possibly look for it unless it were somewhere in connection with the 'rules' themselves, as distinct from the results that follow from setting the rules to work upon a subject-matter. But then there is only one kind of 'truth' that this could mean, so far as I am able to get any clear notion about it. I am proposing, we will say, to build a house, and I want to get a specified number of rooms, meet certain requirements of taste and comfort, use reasonably good materials, and expend not more than ten thousand dollars. These constitute my original conditions, or 'propositions,' which are to 'generate' the plans. Now in so far as I succeed in meeting the specifications I get a definite architectural result which is new; but this, as before, means only that I am manipulating certain material of knowledge—space demands, market conditions, and the like—in assigned ways, so as to render possible new discoveries about its relationships. But about the specifications also I discover something new,—their *feasibility*, namely, or the possibility of their being actually carried out. The thing I want to find out, and which I do not know at the start, is whether the different conditions can be combined in one con-

crete outcome. If they can, then I have learned that, given the nature of the world, the various propositions are compatible; if two requirements—say of size and cost—can by no possibility both be fulfilled, they are said to be in contradiction. But now while these are truths about the conditions themselves, they are, equally with other truths, dependent upon the nature of the material on which the conditions are imposed, and so upon intuition.

And otherwise it looks to me as if the supposed novelty must always be contained somehow in the premises; if we overlook it, it is because we are deceived by the complexity of the facts. We can in a complex system turn certain perceived relationships into rules of procedure, which may seem to lead to novelty. Thus a library classification helps us find a book of whose location we might be unaware. But evidently here the 'rule' is only a rule for putting one's hands upon something without a previous knowledge of which, by someone, the rule would have no meaning; it works only because I can presuppose a system which already contains all the facts, though this may be too complicated for me to hold in mind all at once, and so I have to work out the result indirectly. And if there is some further source of novelty, I can only hope that the new logic can see its way to a more persistent and sympathetic attempt to tell us precisely what it is, in language that takes account of the limitations of the non-mathematical mind. For I am very certain that it has not yet taken as much pains here as it might; one could even suspect it of a sort of pride in technicality and paradox. This doctrine of propositions generating facts, for example; surely there must be a simpler way to state the truth here, if truth there be. Accordingly, until further enlightened, I shall continue to hold the older doctrine that certainty attaches only to the realization of human meanings, which constitute not the material of reality, but only the machinery for thinking it; that logic is not productive, having to do merely with the analysis and ordering of these meanings; and that all significant knowledge depends upon a further sort of fact, in the nature of 'experience,' which is neither certain nor necessary.

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THE MECHANICS OF INTELLIGENCE.

THE aim of this paper is to examine the way in which 'intelligence' acts upon 'voluntary' muscles in the light of present-day knowledge of mental and physiological phenomena. Our working hypothesis is the assumption that mental and nervous phenomena are two aspects of the same thing.[1] We shall endeavor to show that the processes which actually occur in 'intelligent acts' can be brought into line with the general concept of causation.

The equivalence of cause and effect is essentially a modern notion. To uncritical examination there often seems no quantitative or qualitative relation between the antecedent and its consequent. The ancients observed that rubbing together two sticks results in flame and heat; that striking a stretched membrane is followed by sound; that consumption of food by an animal leads to growth. They noticed that when wood burns its substance disappears; that energy or force is lost through work; for example, when a ball is started rolling, it gradually slows up and finally comes to rest. Countless experiences indicated that causal sequence is at times quite lawless. One quality in the antecedent may become transformed into another quality in the consequent; a given amount of energy in the cause may apparently be transformed into a different amount in the effect.

When every-day life yields so many examples of apparent disparity between antecedent and consequent, it is not surprising that the ancients accepted certain instances of causation which today appear fanciful or mystical. Why should not a magical

[1] As Titchener puts it, "mind and body . . . are simply two aspects of the same world of experience" (*Textbook of Psychol.*, p. 13). The term 'double-aspect theory' seems to characterize this standpoint most appropriately. W. McDougall objects, however, that the word 'aspect' implies *one single* observer. To avoid misconstruction of the theory on this ground some may prefer to call it the 'double-nature theory,' *i. e.*, the reality in question is at once subjective and objective. This theory has been developed in the writings of Fechner, Spencer, Lewes, and others. The writer has restated the view in a previous paper to which the reader is referred. ("The Mental and the Physical," *Psychol. Rev.*, 1914, XXI, 79–100.)

word properly uttered cause a castle of stone to appear or vanish? Why might not a bare thought, unattended by any material phenomena, cause the thinker's arm to move in a different way from that determined by muscular conditions and the balance of physical forces?

Little by little man has discovered a regularity in the sequence of events. Energy is not actually lost; it is merely transformed or dissipated. Matter does not appear and disappear; it merely undergoes changes of form. As a result of these rearrangements matter may for a time become imperceptible; when certain chemical compounds are formed it may take on new appearances and assume new qualities. On the basis of cumulative evidence, science to-day postulates the *persistence of matter and energy*. In all the causal transformations of energy and matter nothing is created and nothing goes out of existence. The causal relation appears as a *readjustment* of material particles. Of the particular transformations involved, some are classed as physical, others as chemical. The causal series as a whole is regarded as a set of physicochemical changes. Broadly speaking, cause and effect are seen to be equivalent.

One aspect of causation, however, has not yet been brought fully into line with our general formulation; one sort of activity is still deemed by many scientists an exception to the rule of equivalence between cause and effect. The phenomena of consciousness, especially the manifestations of human purpose and intelligence, are treated by some writers as causes of bodily movement without any thorough attempt to analyze the process by which the movement is effected. It is assumed (almost postulated) that where the activity of an organism is preceded by consciousness, the result is in some way characteristically different from other kinds of sequence: that this type of causality is inexplicable in physicochemical terms. In other words, it is held that the doctrine of the conservation of energy requires some qualification (if indeed it is not actually invalid) where *purpose* and *intelligence* are concerned.

Now it may very possibly be that the conservation of energy is not a universal principle. This is a question of fact, not of

'*a priori* necessity.' But in the first place no such exception has so far been demonstrated, while the careful investigations of physicists and chemists furnish abundant evidence for the truth of the principle wherever rigid tests have been made. In the second place, pending a crucial test, the assumption of conformity offers a better working hypothesis than the postulate that phenomena of purpose[1] and intelligence are at variance with the rest of nature.

If one observe merely his own experiences, the 'interaction' view of the mind-body relation seems to be confirmed. I think of performing some action. I 'will' to do it, and the appropriate action takes place. Apparently the process is something totally different from physical causation, which is a readjustment of material particles. In volition the antecedent is a personal experience; the consequent is muscular contraction and bodily movement. But the disparity is lessened when we consider the physiological activity which is going on at the same time as the thought and volition. In very simple cases we might plausibly assume a gap in the physiological circuit, filled by a non-physiological process whereby a non-material substance receives an impression from the brain and later gives forth a directive expression to the brain. But in cases of prolonged thinking the evidence is against this assumption. Fatigue and heightened temperature of the cerebral region accompany the thought process.

Moreover, the very theory which upholds the efficiency of consciousness 'as such,' insists that reflexes, instincts, and autonomic activity are 'purely physiological'—that they proceed without the intervention of consciousness. In other words, it accepts the modern causal notion for the lower stages, but assumes that where there is vivid consciousness of the situation, this 'awareness' or 'intelligence' causes the motor result to be different in type from any 'purely physiological' reaction.[2] To

[1] Purposive consciousness has been examined by the writer in a paper entitled "A Study of Purpose," *J. of Phil., Psychol.*, etc., 1916, XIII, Nos. 1, 2, 3.

[2] "A reflex act . . . is one in which a muscular movement occurs in immediate response to a sensory stimulation without the interposition of consciousness. Consciousness is often aroused by reflex actions, but the motor reaction is not

the physicist this means that at some point in the series of physicochemical changes which are occurring in the brain the transfer of energy does not follow the line of least physical resistance. Either energy is lost or gained; or the moving particles take a different path from that marked out by the resultant of forces; or their motion or chemical activity is temporarily suspended in a way not explained by the physicochemical forces operating upon the brain substance.

Our means of observing nervous activity at work are still too defective to demonstrate whether or not such a break in the causal sequence actually occurs. There may or may not be 'points of discontinuity' in the resolution of forces. But there appears no justification for assuming a new type of agency to explain intelligent activity unless the physical outcome is in some way different in type from the effect of so-called 'purely physiological activity.' In reflex action the circuit of nervous activity is complete, and muscular contraction is generally admitted to be the result of a continuous series of physicochemical processes. The only ground for assuming that consciousness interferes with the ordinary progress of nervous impulse and discharge would be that the motor outcome of cerebrally conditioned acts is inexplicable in terms of ordinary nervous coordination.

The interactionists believe that such is the case in intelligent acts—that 'intelligence' yields results which are wholly irreconcilable with physicochemical mechanism. The construction of a building, the composition of a musical symphony or poem, the demonstration of a scientific principle, or the solution of a problem—such acts as these involve 'thought' and 'intelligence'

executed in response to conscious motives, and in the more deeply imbedded reflexes consciousness is quite powerless to suppress the movement." (Angell, *Psychology*, 4th ed., p. 337.)

"Wherever there is a variability in response, there we may assume is a consciousness, which can be legitimately interpreted as being instrumental in this response." (Colvin, *Learning Process*, p. 4.) "Habits when fully set up proceed without conscious direction. . . . Consciousness is functional up to the point where new adjustments . . . are perfectly formed. Then it is that consciousness as a directive influence recedes and the organism adjusts itself with automatic precision. . . . If the adjustment is adequate, then there is no further need of conscious direction, hence consciousness tends to disappear." (Colvin, *op. cit.*, p. 46.)

as part of the antecedents. The outcome, say the interactionists, is modified by consciousness; such physical collocations as are observed in the Parthenon or its frieze could not have been attained unless some non-physical agency intervened in the series of physical transformations.[1]

Types of Intelligence.

Intelligent activity appears in a variety of forms. We may distinguish between (1) *creative intelligence*, as exemplified in original productions of art, (2) *invention*, which involves an original combination of general phenomena into new forms, (3) *imitation*, the reproduction of results belonging to the first or second class, and (4) *intelligent adjustment* to new situations.

Of these types the third need not be discussed separately. It may be assumed that imitative repetition does not involve any factor not found in creation or invention. Further, it appears that invention involves practically the same factors as adjustment to specific situations, with the additional factor of generalization. Thus, if we study an intelligent adjustment which involves the process of generalization, we can combine the second and fourth forms—invention and intelligent adjustment—in a single analysis.

The first type differs rather noticeably from the others. Creative intelligence, as observed in the world of art production, is distinguished from invention and adjustment in being less tied to specific conditions. The poet and the sculptor are 'freer' to express their thoughts. The thought process of the creative artist finds expression in vocal utterance, graphic movements, painting, chiseling, and other physical movements. The distinctive problem here is: How can such a phenomenon as a 'thought' produce movements resulting in physical collocations

[1] It may be suggested that this view confuses scientific *determinability* with *determinateness*. To 'determine' all the significant antecedents in the process of designing the Parthenon or its frieze might be practically beyond the scientist's power, owing to the complexity of the factors involved. But this complexity does not render the result any the less 'determinate.' The problem is not to catalogue the individual factors concerned in intelligent causation, but to determine whether physicochemical mechanism as such is sufficient to explain the characteristic features of the result.

which, when they stimulate the senses of other beings, arouse thoughts and feelings corresponding to the thoughts and feelings of the artist? Otherwise the problem is the same as in invention and adjustment.

Professor Thorndike's critique of the ideomotor theory[1] seems to demonstrate conclusively that the specific neural associations between cortex and motor paths are due to chance, that the ultimate correspondence between idea and act is due to natural selection or survival of the fittest. There is no inherent principle whereby a thought must at the outset produce the corresponding movement. This seems to dispose of the problem peculiar to art production. There remains the problem common to all types of intelligent activity: How does intelligent thought produce 'intelligent' collocations of matter?

The most unequivocal examples of intelligence are found in problems and 'problem-games,' where prolonged deliberation precedes actual movements. Games of cards (social or solitary), mechanical puzzles, and above all chess, are typical of this. In chess each move by one's adversary may yield a distinctly new situation, so that every game involves a series of problems. The opening moves have been standardized and are learned from a teacher or book. So also are the initial position of the several pieces, the rules for moving, etc. But there is this difference: the original placing is fixed and the moves are strictly defined, while the line of play offers some variety of choice even at the outset. As the game develops the outlines given in the manuals are left behind and the player is thrown upon his own resources.

It appears, then, that chess presents three patterns of activity: (1) Learning certain principles or rules; (2) choosing at the start between certain alternatives, none of which obviously outweighs the others; and (3) determining from move to move upon a satisfactory procedure.

We may pass over for the present the learning process.[2] The choice of the opening is not particularly significant for our problem. The third type of activity involves a very high degree

[1] *Educational Psychology, Briefer Course*, pp. 75–83.

[2] See below, pp. 615 ff.

of intelligence. We shall therefore examine first of all situations which occur after the game has well started.

INTELLIGENT SELECTION OF MOVEMENT.

Let it be assumed that the player, White, has learned the theory of the game and has selected his opening, to which his opponent has responded by one of the options offered in the books. The game proceeds through several moves by each player. The situation which has developed when White is about to make his fifteenth move is shown in Fig. 1.[1] White perceives that if his Bishop takes the Knight it will be taken by the opponent's Pawn or Queen without yielding him any advantage, while any move of his Pawns or King is a waste of time. He observes three promising alternatives: (*a*) Queen takes Queen, check, or (*b*) Bishop takes Rook, check, or (*c*) Rook takes Rook. The first yields White an advantage in pieces, since he may win a Rook clear on the third move. The second alternative (*b*) threatens both King and Queen. To save his Queen, Black must take White's Bishop, not with the Queen (which would still be threatened) but with the Knight. If so, White can bring Queen to

[1] This game was actually played by Morphy (White) against two players in consultation. (See Gossip's *Chess Players' Manual*, p. 60.) It is selected as an illustration of 'very high intelligence.' The play developed as follows:

White.	Black.
1. P to K 4	P to K 4
2. Kt to K B 3	P to Q 3
3. P to Q 4	B to K Kt 5
4. P takes P	B takes Kt
5. Q takes B	P takes P
6. B to Q B 4	Kt to K B 3
7. Q to Q Kt 3	Q to K 2
8. Kt to Q B 3	P to Q B 3
9. B to K Kt 5	P to Q Kt 4
10. Kt takes P	P takes Kt
11. B takes Kt P (ch)	Q Kt to Q 2
12. Castles (Q R)	Q R to Q sq
13. R takes Kt	R takes R
14. R to Q sq	Q to K 3

The conclusion of the game was as follows:

15. B takes R (ch)	Kt takes B
16. Q to Kt 8 (ch)	Kt takes Q
17. R to Q 8 mate	

Knight's 8 and give check. Then Black can neither interpose nor move his King, and the only reply is to take White's Queen with the Knight. But if so White could bring his Rook to Queen's 8 and give check again, which would be mate. Following out in the same way the remaining alternative (*c*), White finds nothing in the series leading to a quick and decisive victory. White accordingly for his fifteenth move plays K B takes R; Black does not sacrifice his Queen, but plays Kt takes B as White anticipated. White's sixteenth move, Q to Kt 8, 'forces' Kt takes Q, and the game is won by White on his seventeenth move, R to Q 8, mate.

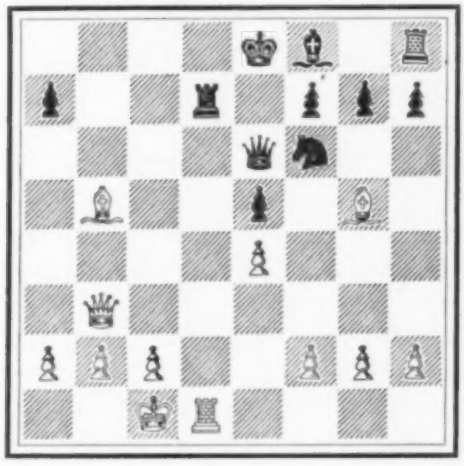

Fig. 1.

Here is a typical example of intelligent combination—that is, movements combined in such a way as to bring about a satisfactory result. It is similar to the type of intelligent combination of movements whereby we open a door, solve a mechanical puzzle, reach the summit of a difficult mountain, etc., with one noteworthy difference. In chess we have two intelligences working against each other. Thus in the present instance there is open to Black on his fifteenth move the alternative of sacrificing his Queen and prolonging the game.[1] White cannot foresee the result of his own acts with the same degree of certainty

[1] There is also the possibility of Black's making an illegal move, or upsetting the board, or walking away in a pique.

as in the case of opening the door, working a ring puzzle, or the like. But his 'intelligence' includes knowledge of his opponent's mental limitations as well as ability to picture combinations of movements. The activity pattern found in chess is similar to that displayed in political or social activity. It is a simplified example of the highest known type of intelligence.

The problem before us is to determine whether White's movements are wholly explicable in physicochemical terms, or whether his thoughts, apart from their neural concomitants, alter the regular course of physical events.

In the first place it is to be noted that the thought process (according to every indication) is accompanied by very strenuous physiological activity. The player shows marks of exertion, strain in the finer adjustment muscles, great fatigue when the thought process is prolonged and intense. There is no indication that the nervous data are 'handed over' to a distinct non-physical sphere when the player 'studies' the problem, or that the brain activity remains in suspense until consciousness determines the solution, or that the decision of consciousness is 'handed down' from a non-physical sphere to the brain which thereupon energizes the appropriate motor tracts. On the contrary, the evidence seems to show that the thought process is accompanied by brain activity at every stage, that currents pass from center to center in the cerebrum while the player studies over the situation, that the 'birth' of each thought is accompanied by a process of nervous integration such as accompanies simple perception.

If we examine any one of White's thoughts while he is considering his fifteenth move, we find it to be a representation of *some situation* on the chess board. First there is the present situation with the position of one of his own pieces altered; then the latter situation with one of Black's pieces moved, then perhaps this last with one of his own pieces moved, and so on.[1] The thought of any one of these positions includes a feeling of the *relations* of the several pieces to one another—mutual support of White's pieces, mutual support of Black's, attack of certain pieces upon

[1] The removal of an adversary's piece is involved in some of these pictured rearrangements.

certain opponent's pieces, check, threatened check, etc. In this respect also White's thought concerning any future situation resembles his perception of the actual situation on the board before him. The sensory characteristics of his imagery need not concern us here, nor the possible imageless thought of a blindfold player, nor (for the moment) the clearness or vagueness of detail in the image or thought. Our problem is whether the transfer of nerve energy from point to point in the brain and sensori-motor tracts, together with the integration and discharge of such nervous activity, furnish antecedents sufficient to account for the player's actual moves.

We observe that an 'intelligent' move is not made until the player has represented in turn a certain number of thought situations. The situations are not all simple alternatives, but to each alternative there may be two or more resulting alternatives, etc. The whole group of thoughts, so far as the relation of its separate terms is concerned, forms an arboreal scheme with frequent branching and re-branching. The end-term of each branch is a situation which involves a set of relations among all the pieces on the board, and some of these end-term situations involve relationships which are more satisfying than other end-terms. The player compares the several end-terms and (usually) makes the move which affords the greatest degree of satisfaction.

The comparative intelligence of several players in the same situation is measured by their respective ability to represent more of these series, to carry them out further, and to grasp clearly the relations involved in each situation.[1] To put the case negatively, a poor player is one who either 'overlooks' an important move (or contingency), or who does not 'see ahead' far enough, or does not notice some relationship in the moves which he has actually considered. Certain relationships, such as 'an advantage of position,' or 'a pawn or piece won,' or 'checking the opponent,' or above all 'declaring mate,' afford satisfaction, and the satisfaction is the same whether the situation which involves these relations is perceived or merely imaged.[2]

[1] The speed or rapidity of the process is also an element to be considered. All these criteria indicate that intelligence is a quantitative phenomenon.

[2] The nature of 'satisfaction' will be examined later (see pp. 618 f).

At first glance it may appear that the 'relationships' are something distinct from the physical situation. But more careful examination shows that they are essentially a part of the represented collocations of material objects. A 'piece won or lost,' whether perceived or pictured, is an actual change in the relative number of white pieces to black pieces on the board. An 'attack' by White's Bishop on Black's Knight means that White may remove the Knight from the board; while the 'support' of Black's Knight by his King's Knight's Pawn means that should the Knight be removed, Black's Pawn may in turn remove the piece with which White has taken it. An 'advantage in position' means a position involving more of such attacks and supports by the player in question than by his adversary. 'Check' means an attack on the adversary's King, and 'mate' means that the adversary's King cannot be withdrawn from attack by any allowable move.

The point to be emphasized is that the thought process involved in chess-playing is analogous to perception—that an intelligent reaction based upon thought is essentially the same (except for greater intricacy of stimuli) as the reaction to a perceived situation. The mental reconstruction is no different in character from the reconstruction of experience which is involved in a changing perceptual experience. The player acts to a thought situation as one acts to a sensory situation. He *observes* the possibilities—he does not 'create' them. He is in fact reacting to physical situations, present or represented in thought. When one reacts to a *perceptual* stimulus one's motor activity is due to the fact that a certain physical collocation of particles exists and affects him; which means that his receptor apparatus is fitted to receive the impression of this collocation and that appropriate nervous pathways are established for reaction to such impressions. The same is true where the stimulus is a *thought*-complex; here one is reacting to certain *definite represented physical collocations*, not to an esoteric figment of the imagination. Thought is indeed merely an enlargement of the perceptual field. Intelligence means 'fit' reaction to environmental situations, whether perceived or pictured. In short, one's degree of intelligence

depends upon the exactness with which one's thoughts represent physical reality, and one's thought-sequences represent real physical changes.

In highly intelligent activity an exceedingly complex situation involving past, present, and future physical collocations[1] serves as stimulus. The external stimuli operating at the time are modified by conditions in the brain due to previous stimuli, which give rise to neural processes known introspectively as 'thoughts' of future situations. The nerve impulse at length finds an outlet in motor channels through connections established by repeated experiences, or it may form some new connection along a line of lesser resistance. The complexity of the thought process means that a large number of neural connections within the brain are formed prior to each play. Intelligence means, in neural terms, that the less satisfying plays find no motor outgo—that only one out of many incipient reactions is completed. Each of these incipient reactions is based on a stimulus situation (perception or thought); if not modified by the other concomitant situations it would pass over into actual play. Suppose that only one such neural connection were formed and the corresponding play followed immediately: then once in a certain number of games the moves we have described might result by 'pure chance.' It seems evident, then, that the chess player who guides his game to a successful conclusion is reacting quite as truly to physiological stimuli as a man who 'instinctively' raises his hands and wards off a blow. The chief difference is in the complexity of the cerebral connections.

Precisely the same is true of other complex intelligent acts. In a game of bridge whist the intelligent player is the one who 'sees ahead'—who picks his lead so as to establish a suit, or in order to trump in presently, or who finesses from a tenace. The stimulus-situation in such cases is not merely perceptual, but a complex of perception and thought. Yet by 'pure chance' a player *might* lead the very card which 'intelligence dictates.' On the theory of probabilities each card in a given hand would be led once in 13 times; intelligence means the suppression of the

[1] Also many imaged collocations which never 'materialize.'

12 less satisfying reactions every time. This intelligent selection of one path out of the 13 is as much a matter of the parallelogram of forces as the zig-zag path of lightning or the erratic course of a rivulet in a furrowed field during a shower.

So, too, in situations of greater complexity. The commander planning a campaign, the statesman outlining a policy, the business man directing a corporation—all react to a complex stimulus-situation in which the perceptual stimuli are relatively unimportant and the thought-stimuli are many and intricately interwoven. Whether one is working against rival intelligences or merely against unknown conditions in the environment does not affect the nature of the neural process and the motor discharge.

The physiological concomitant of the thought processes concerned in invention may be analyzed into precisely the same composition of neural forces. Actions analogous to invention, though on a somewhat lower plane, are experienced in ordinary life when we solve a puzzle, such as a charade, riddle, or conundrum, an artificial chess-problem, or a solitary card-game, or when we devise a puzzle to fit a given solution.[1] It is true the solution of a problem is sometimes reached so quickly that the process seems uncanny. With our predilection for the mysterious we are apt to attribute the process to an innate power of intuition, to inspiration, to a familiar demon within us, to consciousness working independent of neural activity, and the like. Once in a lifetime a simpleton may stumble upon a really clever solution by pure chance. But except in rare cases the fittest solution—the most intelligent—is performed by the individual with the most complex nervous system.

Granted, then, that a highly intelligent act is merely more complex than ordinary ideomotor activity, and not different in character, we may supplement our chess illustration by some simpler situation. The common act of opening a door involves grasping the knob, turning it to the right or left, and then pushing or pulling. These five separate movements are learned early in childhood. Grasping is a reflex which appears in man at birth. It is found in the lower primates also. The contact stimulus of a

[1] One of these simpler cases might have been selected for illustration instead of the chess-game.

stick, knob, etc., leads to the movement. Few of the interactionists would maintain that the neural integration involved in such an act as grasping is brought about by consciousness. The sensory current passes to a coordinating center and thence an impulse issues through motor paths to the muscles.

Turning the hand to left or right, in a rotary movement, is likewise the result of sensory stimuli. The child learns to twist a rope, stick, door-knob, and other objects. Pushing and pulling movements are also observed in very young children. Each of these separate movements (and for that matter any other coordinated muscular contraction) is brought about by a current in the appropriate motor nerves, and this motor innervation is preceded by a current in the sensory nerves following stimulation. There seems no doubt but that changes of stimulation and resulting changes in the sensory current may produce modification of the motor current and differences of muscular action *irrespective of awareness*, and that combination of sensory impulses may produce complex movements apart from cerebral activity and consciousness.

In short, whether we examine simple or complex instances of intelligence, in every case we find that the motor activity is the result of nervous impulses due to physical stimuli and central conditions. Intelligence is a function, not of conscious 'intuition,' but of the connection between afferent and efferent nerve tracts. It denotes an adjustment between the environmental situation and the responsive activity, and this adjustment is brought about either by inherited neural paths or by individually acquired connections. The motor impulse in every case presumably follows the path of least resistance. There is no need to assume a non-physical 'guiding' agent, in order to explain why the nervous current comes to follow certain paths rather than others.

Learning.

If we examine the learning process we reach the same conclusion. The learning process consists, physically, in the formation of new nerve paths through the establishment of new connections at the synapses. It differs from reflex formation in that a single

definite path is not marked out for the nervous discharge by the structural arrangement of the neurones. In habit formation a new pathway is opened up as the line of least resistance; by repeated passage of the nerve current this pathway becomes fixed just as in the case of reflexes, except that in habit formation the fixation is gradual, while in reflex formation it is immediate.

Opening the door is a learned reaction. The separate stimuli leading respectively to the grasping, turning, and push-or-pull movements may occur together. By chance at some period in the child's life they operate in such a manner as to produce the proper sequence of movements, and the door is opened. The fixation of this or any other habit depends upon repetition, whereby the path of discharge becomes permanently a line of lessened resistance. The acquisition or original performance may occur either through a trial and error process or as the result of social stimuli.

In chess, learning the position of the pieces, their moves, and the theory of the game is a social process. When we are told that "the Queen moves in any direction, straight or diagonally, unless intercepted by a piece, and in so moving may remove an opponent's piece and occupy the square," the words serve as stimuli which arouse a set of representations of various positions of the Queen on the board. Each of these images or thoughts is accompanied by definite physiological processes in the cortex which serve as bases for neural connections during the game. And so for all the 'rules' and values of the game. When the various rules have been learned and we are engaged in playing an actual game, a series of situations is presented, each of which involves several of these acquired neural connections, and these situations change with each move. For example, in our chess illustration White's fifteenth move, King's Bishop takes Rook, alters the relations of most of Black's pieces, especially in view of the declared 'check.' After each move a definite *perceptual* situation is presented, to which is added a *thought* situation which is more or less complex according to the neural capacity and training of the player. Taken by itself each separate element in this complex situation is analogous to any simple habit which has been partly formed.

In any typical intelligent reaction there are great differences in the stimuli from time to time and corresponding variations in response. At table we use the knife for certain purposes, the fork or spoon for others.[1] We pat the dog and run from the wolf. These learned discriminations indicate that the total situation involves more than the perceptual elements. In perceptual reactions there is discrimination of stimuli and different responses to variations in the situation; the higher intelligent reactions involve in addition the memory of certain conventions, specific characteristics, and the like. There may be lapses of memory—as when we move the pawn two squares or attack the soup with our fork. There may be failure to discriminate—as when we move our opponent's piece in chess or attempt to caress a polecat. But in all instances, whether of suitable reaction or of false reaction, the presumption remains that the motor impulse is the direct outcome of the sensory impulse as modified by the brain condition at the time. To say that we are 'conscious of the performance' of the act does not add to the explanation of the physical changes which occur, nor does 'lapse of consciousness' add to the explanation of inappropriate reactions.

In this connection we may refer briefly to another type of activity which is often supposed to demonstrate the motor rôle of consciousness. When one is in danger of forgetting an important engagement he 'impresses it upon consciousness' and 'keeps it in mind.' It is argued that the consciousness of having to perform the act facilitates the subsequent performance. And so it does. But surely the formation of nervous paths which accompanies the reiterated thought should be taken into consideration. On the other hand there are abundant instances in which the appointment is set for an hour, a day, or even longer ahead, and then 'dismissed from consciousness'; but the brain pathway has been established, and often when the proper time comes the action is started as readily as if we had been conscious of the coming situation every instant in the interim. In both cases, then, we may reasonably conclude that it is the *retention in the nervous system* which initiates the act—not the bare thought.

[1] Not always of course; and on the other hand one sees children move chessmen about in utter disregard of values.

SATISFACTION.

There remains to consider the feeling of satisfaction which attaches in different degrees to the alternative responses represented in intelligent thinking. The term 'satisfaction' is an introspective description of an hedonic psychophysical state. The physical basis of certain emotions has been traced to changes in the internal secretions. The presumption is that a similar physical concomitant exists in the case of simple feeling. In music certain chords yield greater satisfaction than others. It is found that the less harmonious clangs are those in which beats occur between some of the fundamentals or difference tones. In color schemes clashing hues are those which arouse partly similar, partly conflicting retinal processes. Intelligent thought involves a general notion of result and particular representations of successive situations. The harmony or discord between the 'problem' idea and the 'solution' idea in all probability sets up through the autonomic system an organic process, either anabolic or katabolic in character, which acts as a stimulus to modify the central nervous system. In the case of harmony or fitness the accompanying state of consciousness is called 'satisfaction,' in case of discord it is called 'dissatisfaction.' The *degree* of satisfaction feeling or its opposite depends upon the intensity of the organic metabolism.

In our chess game the highest degree of satisfaction attaches to the announcement of 'mate.' A similar autonomic stimulation and feeling attach in lesser degree to reaction-and-thought situations which appear to be precursory steps toward mate. The feeling in Black's case is a growing 'dissatisfaction' as the catastrophe approaches. These hedonic accompaniments are observed in many simpler instances of activity. In opening a door there may be no heightened satisfaction, but certainly a diminution of satisfaction, if not actual dissatisfaction, is experienced when the door proves to be locked. Satisfaction, then, appears to be the subjective aspect of a neural condition stimulated by systemic processes which are autonomically induced.

It is not within the scope of this paper to propose a theory of nerve physiology. Our aim is merely to show that the mechanics

of intelligent action can be plausibly explained in terms of physicochemical activity. This appears to be true for each of the factors examined—intelligent selection of movement, learning, and satisfaction. While it would require a host of experimental investigations to trace the course of the nerve current in these complicated cases, there appears no reason to assume that physicochemical processes are insufficient to account for the type of phenomena observed in intelligent action.

Of course it is still open to the speculative mind to assert that a non-physical force is really the efficient agent in any or every type of activity. There seems no way of demonstrating conclusively that the action of gravity is not really due to beneficent demons who pull loose objects towards the earth, or that angels do not guide the movements of the planets in their orbits. But science to-day deems these hypotheses superfluous. So in intelligent activity, the notion that consciousness interferes with the admitted physicochemical processes seems redundant. Whatever the rôle of consciousness in nature, it is *not* the guidance of motor activity. The mechanics of intelligent activity follows the same pattern as other movements and transformations of energy—except that, owing to the intricacy of the nervous system, adaptive actions are vastly more complex than the simple types of change found in inorganic nature. The laws of physics and chemistry hold for intelligent organisms as well as for atoms and electrons.

The Rôle of Consciousness.

A word in closing on an objection which is often raised against our working hypothesis. The double-aspect theory has been stigmatized as epiphenomenalism. The question is asked: Of what use is consciousness in the world if it is not needed to guide action?

1. In the first place, the scientist is not concerned with the speculative problem as to whether everything in the universe is useful. It is his business to discover by observation whether phenomena are useful or not, rather than to indulge in *a priori* dicta concerning their utility.

2. The criticism implies rather unwarrantably that the value of consciousness would disappear altogether if it prove to have no motor function. Surely apart from its problematic rôle in moving matter or altering the direction of motion, consciousness supplies to the individual the essence and charm of life. However much my actions may be determined mechanistically or unconsciously or subconsciously, it is my *conscious* experiences—my perceptions, feelings, imaginings and thoughts—that mean life to me. The proved value of consciousness is the subjective life which it furnishes to the individual.

3. In the present paper we have endeavored to show that the mechanics of intelligence follows the same physicochemical laws as the other motor processes in nature. Nevertheless our description of intelligence is incomplete unless we analyze thoroughly the perceptions, thoughts, and other phenomena of consciousness which accompany intelligent activity. The writer believes that it is the province of science to study *all* the facts of nature. Introspective psychology reveals certain phenomena or aspects of nature which the other sciences miss. The epiphenomenon is no less a datum of existence than the hypophenomenon. Physiology and behavior serve to explain the causal relations of events; but they do not deal with the subjective aspect of experience. Our scientific examination of nature is incomplete if it does not include the field of consciousness.

SUMMARY.

The notion that consciousness, apart from neural activity, is an efficient cause of intelligent action is a survival of the prescientific conception of causation. To the modern scientist causation means transformation of matter and energy. Introspection and objective observation both indicate a continuance of brain activity during the period of deliberation which precedes an intelligent act.

Intelligent acts include (*a*) artistic creation, (*b*) invention, (*c*) imitation, and (*d*) adaptive action. The essential features in all are similar. Our analysis was based on adaptive action, as exemplified in chess.

Adaptive acts involve (*a*) *selection*, from among certain (*b*) *learned reactions*, of such as give greater (*c*) *satisfaction*.

Examination of the *selective process* in acts characterized by high intelligence indicates that it involves a series of images or thoughts, progressively differentiated from the perceived situation. Among the many stimuli (perceptual and representative) which constitute the 'total situation' at any moment, one alternative initiates the response while the remainder are inhibited. As between alternatives, the motor impulse follows the line of least neural resistance; this is 'intelligent selection.'

The *learning process* proceeds either by trial and error or by social stimulation. It consists essentially in building up new nerve paths of lessened resistance.

Satisfaction and its opposite have also a neural basis. They are the conscious aspect of neural activity stimulated by systemic conditions which are excited through the autonomic nerves. The neural activity characterized consciously as satisfaction determines the path of least resistance in intelligent reaction.

It follows that every factor concerned in the manifestation of intelligence may be adequately explained in neural terms, rather than by the guiding influence of consciousness. This does not demonstrate absolutely that consciousness is not an efficient agent in action, but it indicates that intelligent acts may be causally explained without attributing mechanical efficiency to consciousness. It places intelligent acts on precisely the same footing as other physical and chemical changes.

The value of consciousness thus appears to lie, not in any motor rôle, but in its furnishing the tang of life to each individual. The data of consciousness are facts, and as such deserve scientific investigation like other phenomena in the universe.

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PHENOMENA AND THEIR DETERMINATION.

IN the village of Bryn Mawr there were last year no less than four pairs of little girl twins while, so far as I know, the population did not include a single pair of boy twins. How shall we classify this fact? So far as is known, the sex of offspring is not determined by environment, nor is the occurrence of twins. Shall we then say the fact that four pairs of girl twins have been born in that particular environment and no pairs of boy twins is mere chance coincidence? Doubtless this classification is a proper one for common sense and even for natural science. The fact sets no problem to biological science, nor as a social phenomenon is it really significant. Viewed more largely, however, it is seen to offer certain difficulties. For to regard the fact under consideration as mere coincidence seems to set limits to the determination of events by law, to deny the uniformity of nature. Even if some of us, like William James, be opposed to the notion of a 'block universe' where everything is predetermined and there is no room for human freedom, none of us would be inclined to regard the occurrence of girl twins as falling within the class of events amenable to free choice. On the contrary, the growth of biological science has convinced us all that there are fixed and definite physiological causes which determine the sex of offspring and the production of twins. Just what these conditions are we are not yet sure, but it is not open to us to doubt that the birth of every child is as wholly the outcome of antecedent natural conditions as is the fall of a shower of rain. But if this is our conviction, are we not bound to say that the state of affairs in Bryn Mawr is no mere coincidence, but would reveal itself to a deeper and wider knowledge as the effect of causes acting in accordance with natural laws?

To this question I shall venture to give a negative answer. The birth of each of the four pairs of girl twins we may know to be determined by definite physiological conditions of the parents,

but this knowledge is by no means sufficient to tell us why there should be four pairs of parents of this physiological constitution at Bryn Mawr, and no parents of the constitution productive of boy twins. The possession of such constutition and residence in a particular locality have no determinate relationship to each other. And this remains true even though we may believe it to be possible that had one, or even all, of the families in question not lived in this locality, some, or even all, of the twins in question would not have been born. For even though in each individual case residence in the village could be known to be in some measure responsible for the birth of these particular children, this connection could not be generalized—that is, it could not be stated in terms of residence in this village and birth of girl twins.

The point may become clearer if we compare the case of the twins with two other hypothetical cases. Suppose that the census showed the presence in Bryn Mawr of thirty per cent more girls of ages between ten and twenty years than boys of the same ages? How would this fact be classified? Probably as the result of the fact that there are five schools for girls in Bryn Mawr and none for boys. If we investigated the causes which had led the various families in question to reside in Bryn Mawr, we should probably find the same reason given in a majority of cases, viz., the desire to educate daughters. Here, then, a *general* connection obtains between residence in Bryn Mawr and the presence of daughters. In contrast with this is such a case as the following. The directory of a town shows that fifteen per cent of the names of residents begin with *T*, the remaining names being distributed among the other letters. Investigation would doubtless show that each of the *T* individuals had some reason for residence in the town, but the tracing of each separate case to a determining condition would not of itself constitute an explanation of the large proportion of *T* families resident in the town. To explain this phenomenon, it would be necessary to discover some ground common to *T* families and not common to families of other initials—a *general* connection between the initial *T* and residence in this town. In other words, explanation of the items making up a phenomenon is no explanation of the phenomenon.

The *coexistence* of these items also demands explanation; and, for this, recourse must be had to an indefinitely delimited 'antecedent state of affairs,' which merges, for lack of specific limitation, into the whole preceding state of the universe.

What stands in the way of accepting the presence of such real indetermination in the universe as the argument claims is a belief in the dictum that every state of affairs is the outcome of antecedent conditions, and that every state of the universe in its full particularity is determined by the preceding state of the universe. But such a universal determination is virtually indistinguishable from an indeterminism. The dictum is insignificant because of its very generality. Explanation of a given state of affairs which applies equally to every other state of affairs is no explanation. On the contrary, to exhibit any thing or event as determined, is, alike for science and common sense, to exhibit it in its specific character as consequent upon equally specific conditions. I use 'specific' advisedly, for it is only as *specifically* characterized that a phenomenon is amenable to scientific determination. In its full particularity it is a mere *this*. Of a *this* all that it is possible to say is, "It is determined by the universe—God made it." But if in its full particularity a phenomenon is indeterminate, no specification includes all the particularities which we may discern to be there. However specified, and every thing may be classed variously, there are items which remain irrelevant to it as thus specified. These play no part in its determination, do not in fact belong to *what* we are engaged in explaining, although they may be constitutive of the phenomenon as falling within some other class.

What distinguishes indeterminate, or pseudo-phenomena, like the occurrence of girl twins in Bryn Mawr, or the preponderance of *T* families in a given town, from real phenomena, is the fact that they are combinations of items severally determinate, but having no common ground. The items, in other words, form a collocation, but do not constitute a phenomenon. They are not elements into which it may be analyzed, but juxtaposed fragments to which it may be reduced. The primary task of science may be said to be, not the organization of phenomena, but the

furnishing the world with real phenomena in place of the fictitious things and events of fancy and myth. Thus astronomy has furnished the world with systems of suns and satellites in place of constellations and zodiacal houses; chemistry has provided reagents instead of talismans, etc. Once the phenomena are provided, the organization of them into systems becomes possible. Or, rather, the same process of thought which distinguishes the phenomena, discerns vaguely at the same time the patterns of their groupings. To complete this pattern, however, it is necessary that the phenomena should be resolved into their elements—the units of design which are the key to the pattern.

The world as it exists for science is a vast network of patterns, the different systems of which overlap and mingle, but which we cannot resolve into a single system of design. The units which we find to be the key of one pattern turn out to be misleading clues when we try to apply them elsewhere. The history of philosophy furnishes us with a long record of fruitless attempts to read the network in terms of the unit of some one pattern. On the other hand, there have been, and still are, those who maintain that the network of things falls into two entirely distinct patterns, the physical and the psychical. These urge that all the larger designs we vaguely discern, whose figures are the things of common life and of the biological and social sciences, reveal themselves to a finer scrutiny as mere complications of the one or the other unit, each distinct from and independent of the other. But neither of these two views is wholly right. The latter is right in denying that no unit suffices to unravel the whole; the former is right in so far as it denies the final independence of the patterns we can trace. For they overlie each other, and while lines and fragments of the one are incorporated in the others, the superposition is, as it were, hit or miss. The elements of design of the one play no part in the pattern of the other. The world is like a great puzzle picture in which we may see now human faces, now animal forms, and now a forest scene. The lines and shades which make the one delineate the others also, but while we see the faces, the forms and the forest disappear, and *vice versa*.

Let us turn to some concrete cases.

The murders at Serajevo will doubtless go down to history as the event which precipitated the great war. This event was the outcome of a political plot against the Austrian government hatched in Servia, and it thus provided an excuse for the attempted subjugation of the smaller state, and indirectly for a German war of conquest. This event, then, was an international affair. Its causes, as well as its effects, can be discerned only by a study of European history. And yet that event was the act of an individual. We do not know in any psychological detail the motives which led the assassin to commit the act, but a hundred contributing factors doubtless played their part—chance scenes, chance words of childhood and youth, etc. So, too, the final act, although committed by one hand, was the result of the words and deeds of his confederates, each of whom was led to the conspiracy by obscure and remote incidents which might be chronicled by their biographers, but which will never figure in the history of Austria or of Servia. For the history of a nation is not made up of the experiences and acts of individuals.

But let us go a little deeper. The murder we should say was the immediate outcome of a conspiracy. We may picture the secret meeting of the conspirators in some attic chamber—the entering one by one of the members, the words of greeting, the discussions. Intermingled with the planning were doubtless bits of irrelevant conversation, tales told, and even, if we are realistic enough in our picture, we should add the varying gestures, the scraping of the chairs, the scratchings of the head, the blowings of the nose. These latter, to be sure, are irrelevant details, which we should not regard as among the acts constituting the meeting. But if we regard the meeting as made up of the acts of the individuals taking part, how shall we distinguish those acts which were constitutive of it from those which were not? So long as we view the event taking place in the attic chamber as a complex of acts of individual organisms—movements of lips and limbs—no 'conspirators' meeting' is discernible. In fact, viewed as a complex of such acts we find no *single* phenomenon at all, but only a collection of coincident occurrences

with no more real unity than the co-presence of the four pairs of girl twins in Bryn Mawr. The acts which made up the meeting were such acts as reports, discussions, resolutions, votes; and these disappear when analyzed into acts of individual organisms.

The disparateness of these ways of viewing the event in question becomes even more evident if we consider it in its alternative antecedents and consequents. As a conspirators' meeting, it grew out of the political relationship of Austria and Servia, and led to the assassination of the Archduke and Archduchess, and thence to the war. As a collection of biological phenomena, the various acts were the outcome of the physiological conditions of the various individuals; and the consequences of these acts were in turn to be found in altered physiological conditions—perhaps in wakefulness, indigestion, and general nervous irritability. The antecedent condition in each individual was determined first by heredity, and secondly by the series of environmental conditions to which he had been subject, food, light, air, etc. Immediately, many of them were direct responses to sense stimuli. The movements of pushing back chairs, of handshakings, of nose-blowings, all had direct sense stimuli. So also had some at least of the vocal utterances, so far as they are analyzable into such physiological elements as contractions of vocal chords, expulsion of breath, etc. Similarly, we must suppose that the subsequent behavior of those individuals was indefinitely modified by the stimuli received and the responses made at this time. But it is beyond the scope of biological science to trace the movements of the assassin in pulling the trigger to auditory stimuli received at the meeting. It is only when we regard these auditory stimuli as significant speeches that we are led to relate them to the assassination and arrest of the conspirators.

But the occurrences of the meeting lend themselves to other forms of description. They are resolvable into mechanical movements in space and time, involving transformations of energy, or, again, into a complex of chemical changes. But the items discriminable in neither of these views consitute a single phenomenon, but, again like the case of the twins or the *T* families,

make up only a collection of juxtaposed fragments. Their several antecedents and consequents are not common; nor is there any reason from either a mechanical or a chemical view to single out, as effects of these phenomena, mechanical or chemical items occurring at the assassination.

What is true of this event is true, in greater or less degree, of any set of happenings which our natural or acquired interests may select. Like the puzzle picture, it may take on varying forms as our vision shifts. If we would see clearly, and understand the meaning of what we see, we must hold our vision steady, for the setting to which one picture belongs is not that of the others. According to our manner of viewing and of describing what we see, will the figures of our picture be related or unrelated to the varying figures of other visions, and our world become ordered in its various ways.

If the preceding considerations be just, they have important consequences. I have elsewhere attempted briefly to show the bearing such a conception has on the problem of the dualism of the physical and the psychical. In a later article I hope to discuss more specifically the relation of mind and body and to show how these same principles may be made the basis of a modified behaviorism. The remainder of the present article I propose to devote to a discussion of its bearing on atomism.

The general criticism commonly passed on atomism by monists is levelled against the assumed independence of the elements in question. Definable only in terms of their relations, it is urged, they are themselves merely relative, and hence logically dependent on the whole. Into this debate as to the logical priority of element or whole, it is beside our purpose to enter. It is not the independence of the elements which we shall question, but the essential incapacity of an atomism to furnish adequate principles of individuation and classification for the determination of the objects held to be constituted by the atomic elements in question.

The simplest case is that of physical atomism. The world of sensible objects which make up our universe—the stones and grass, the streams and clouds—is throughout composed of whirl-

ing masses of atomic particles. The familiar objects about me in the room with their sensible qualities of color, of warmth or cold, of hardness or softness, of brightness or dullness, would reveal themselves to a finer perception as myriads of particles of different shapes and sizes, here densely packed, there far apart, and ever whirling and dancing in varying patterns. But were we beings endowed with faculties capable of perceiving this world in all its minute detail, we should no longer find in it the objects of our human world. We could not see the wood for the trees. Even though for every discriminated difference in our human world we should be able to point out a variation of some sort in atomic structure and arrangement, the resolution of the atomic world into the world of human perception would appear a mere *tour de force*. For the selection, from among all the multifarious actual variations in the atomic world, of those variations which correspond to sensible differences in the human world, would be wholly arbitrary. No principle of selection would be discoverable. The reason for this lies of course in the fact that the perceptual world is relative to the human organism. It is diversity in *relationship* to the living human being which determines the sensible differences we recognize. Variations in the atomic world which do not count as different in their bearing on the organism are not perceived as different. The world as we directly experience it is a world whose features are brought into relief through their projection upon human nature. Taken out of relation to this nature, these features must appear as fragments arbitrarily cut from the atomic world.

So far we have considered atomism in what we may call its pictorial form, conceiving the atom as an entity which a finer perception might reveal to us. But what we find true of physical atomism conceived thus naïvely, holds as well of its more sophisticated forms. The atom of modern physics and chemistry is not an entity endowed with qualities; it is rather a counter in whose terms are reckoned various types of measurable changes. Its value lies partly in the fact that it furnishes a convenient aid to the analysis of complicated processes, but chiefly in the fact that it serves to relate and systematize diverse classes of phe-

nomena, such as temperature changes, chemical reactions, and electrical phenomena. Thus the rise in temperature of a bar of iron when pounded, its combination with a definite weight of oxygen to form ferric oxide, its increase in length when magnetized, and a host of other phenomena it presents, all are explained and related on the supposition of the atomic structure of the iron bar. They are all ideally describable as changes in the equilibrium of atomic forces within the bar. Indeed we may describe the iron bar itself as a complex of atomic elements in a state of equilibrium, the maintenance of which is essential to the integrity of the bar. But we cannot say that all the phenomena which the bar exemplifies are describable in such terms. Nor is the limit to such description wholly factual. There are indeed many phenomena observable in connection with the bar which are not at present explicable in terms of the atomic hypothesis (such as the various forms of steel into which it may enter), but which we may reasonably expect will some day be explained in similar terms. But there are theoretical limits to the applicability of the atomic hypothesis. Consider, for example, the principle of the lever. The iron bar in certain mechanical relations becomes a lever, and while some of the essential conditions of its acting as a lever, *e. g.*, its rigidity, may be referred to its atomic structure, the *principle of the lever* is not describable in terms of atomic relationship. Any actual concrete example of a lever may be a complex of atoms, and any particular case of its action may be ideally describable in terms of readjustments of atomic relationships, but though we had complete descriptions of the atomic changes occurring in a thousand particular cases of raising a weight by means of a lever, we should not find in these descriptions that uniformity of which the principle of the lever is a statement. The same is true in general of the principles of molar mechanics. They are *uniformities of a different order* from those of so-called molecular or atomic relationships. Were we endowed with powers which enabled us to observe the changes undergone by sidereal systems in their relations to each other, we might conceivably be led to formulate laws of such behavior which would bear to our laws of molar mechanics a relation

analogous to that obtaining between those laws and chemical principles. In such unimagined events the force of gravity which we now universalize may control mere irrelevant detail, just as the processes of oxidation which play so important a part in terrestrial phenomena, are irrelevant detail in the movements of the solar system.

Limitations similar to those to which we thus find physical atomism to be subject obtain as well for psychological atomism. According to this theory, all the objects of sense perception are analyzable into groups of sensation elements, or sense data, together with the relations obtaining between these elements. Thus, of yonder oak tree all that is discoverable by inspection is patches of color of differing sizes and shapes, or, if touched, hardness, coldness, etc.[1] Any observable changes which the tree undergoes, whether those resulting from a shifting of my position, or from varying illumination, or from the growth or decay, or even the felling of the tree and chopping it into firewood, are ideally describable in terms of changes in sense data and their relations. In the same way, my particular observations of any sensible phenomenon might be described in terms of sense data, the approach of winter, my experimental verifications of the fact that the addition of baking powder to flour mixtures causes them to rise in baking, or my observation of the behavior of falling bodies. But my observation of the approach of winter this year and last, stated in terms of actually experienced sense data, would yield no characteristic identity.[2] The general phenomenon 'the approach of winter' cannot be described in terms of coexistences and sequences of sensation elements. Much less can we construe in terms of such atomism any such principle as the law of falling bodies. This is essentially the criticism which John Stuart Mill passed upon Berkeley's dictum that the laws of nature are merely statements of the order in which God sends us

[1] With the essential inadequacy of psychological atomism as a theory of perception we are not here concerned. For a discussion of this see articles on "Sensation and Perception," *The Journal of Philosophy, Psychology and Scientific Methods.* XIII, No. 20 and No. 23.

[2] For another presentation of this same general principle see article "The Limits of the Physical," *Philosophical Essays in Honor of James Edwin Creighton*, p. 175.

our perceptions. As Mill urged, the laws of nature represent uniformities, not between groups of sensations, but between objects and events. Not a single causal relationship is analyzable into a sequence of sensation groups. That Mill was further led by his associationism to define an object as a group of possibilities of sensation does not prejudice the truth of this insight.

The fact is that the inspection which resolves the perceived object into a group of sensation elements is not properly an analysis of the object at all.[1] The sensation elements which are the result of such 'introspective analysis' no more truly constitute the objects of the sensible world than the muscular movements of the individuals at a meeting constitute that meeting. Whatever pattern the 'medley of our sensations' may make, its figures bear no determinate relation to the forms whose interweavings make up the perceived universe.

We may sum up the results of the foregoing discussion as follows.

A distinction must be made between pseudo-phenomena and real phenomena. A pseudo-phenomenon is a collection of items, each of which may constitute a real phenomenon, but whose individuation is merely arbitrary. As a whole, that is to say, it does not bear systematic relations to other wholes individuated and classified by similar principles. Hence, as a whole, it is indeterminate, or, what is the same thing, has no *specific* determination, but can be causally referred only to the universe at large.[2]

An equally important distinction is that between the analysis of a phenomenon into its constituent *elements*, and the reduction of it to a collection of items occupying the same *locus*. What is true of it considered in the one character is not necessarily true of it considered in the other. How far any two descriptions of the same *this*, or *locus*, may be mutually interchangeable, *i. e.*, may be taken as alternative descriptions of the *same* phenomenon

[1] For a further discussion of this point see articles on "Sensation and Perception."

[2] Further instances of such pseudo-phenomena are, the distribution of trumps in a given deal of cards, the Great Dipper, the muscular movements of the members of Congress during the debate and passage of the Food Control Bill, and the chemical reactions occurring in the body of Shakespeare during the composition of *Macbeth*.

is a matter, in each case, for empirical investigation. But because certain features belonging to the one description may be found to coincide with discriminable features of another description, it does not follow that the descriptions will coincide throughout.

Philosophical atomism, like any other theory maintaining the universality of a given type of determination, falls into this error, and assumes that because any *locus* may be described in a given set of terms, any *phenomenon* of the universe may be so described. A similar error has given rise to the problem of the dualism of the physical and psychical as I have elsewhere attempted to show.[1] That the more specific problem of the mind-body relation also rests upon such a confusion of thought, I hope to argue later.

GRACE ANDRUS DE LAGUNA.

BRYN MAWR COLLEGE.

[1] See "The Limits of the Physical," *Philosophical Essays in Honor of James Edwin Creighton*, p. 175.

PROFESSOR HUSSERL'S PROGRAM OF PHILOSOPHIC REFORM.[1]

THERE is something inspiring, something which commands admiration and arouses hope in Professor Husserl's proclamation of a reform in philosophy. That at least is one's first impression. He would make philosophy scientific. He admits that the attempt has been made repeatedly before, notably by Descartes and Kant. He admits that previous attempts have fallen short of success. But he holds that they made progress in the right direction, and that the time is now ripe for the step which shall make philosophy once for all scientific.[2]

In this paper I shall undertake to expound some of Professor Husserl's main ideas toward a scientific reform of philosophy. In so doing I shall try to avoid his private terminology as far as possible, and to state his views in the common language of philosophy; I shall restate his thoughts very freely and introduce some illustrations of my own. To this exposition I shall add some paragraphs of comment and criticism with special reference to the relations between Professor Husserl's doctrine and Neo-Realism.

To make room for the scientific philosophy which he seeks, Professor Husserl finds it necessary to show the inadequacy of 'historicism' and '*Weltanschauungsphilosophie*' on the one hand, and of empiricism on the other. The former are anti-scientific in method, the latter pseudo-scientific.

By 'historicism' he means the tendency to emphasize the ceaseless transformation of religion, morals, and philosophy, and to conclude that there is no absolute truth to be found in those fields. Dilthey is mentioned as representing this tendency.

[1] In the following notes "P.s.W." refers to the article by Professor Edmund Husserl entitled "Philosophie als strenge Wissenschaft" in *Logos*, Volume I. "Ideen" refers to the article by the same author entitled "Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie," in the *Jahrbuch für Philosophie und phänomenologische Forschung*, Volume I, edited by him.

[2] P.s.W., pp. 289–293.

The historicist regards this or that type of philosophy as valuable *for* the people of a given race and epoch, but this is only a relative validity. The historicist therefore devotes himself to the study of philosophy as a psychological and historical phenomenon performing certain functions in the lives of individuals and societies—like dress or language. Professor Husserl on the contrary contends that the history of opinion can offer no grounds for deciding the question whether a philosophy having absolute objective validity is possible. It can merely show, with infinite circumstance, that opinions *have varied*—even among the thinkers supposedly most gifted and best trained. But this does not show that no absolute truth will ever be obtained. It does not even show that absolute truth has never in the past been obtained: some one of the numerous doctrines, extant or obsolete, *may* be the correct one.[1] The sceptical aspect of historicism is therefore ill-founded and must not be allowed to prejudice an attempt to make philosophy scientific in method and objectively valid in results.

Professor Husserl regards the '*Weltanschauungsphilosophie*' as an offspring of historicist scepticism. By it he means the tendency to build up a view of the world on the basis of the various special sciences and the manifold experiences of life, without claiming to employ a rigidly scientific method in the process. Such a construction may rightly be recognized as a highly valuable *Kulturmacht* (social and spiritual force). So long as science is silent on issues of the most vital interest, we must trust the 'wisdom' whose vital development produces plausible world-views of profound significance. But such world-views, however profound, are debatable; they struggle among themselves; only science can *decide*. A world-view must be judged as the achievement of an individual—which he must achieve quickly, so as to live by it. Science, however, is the task of many generations and can afford to wait. A world-view is profound or shallow according to the scope of the experience and insight of its author; science and scientific philosophy are neither profound nor shallow but—*evident*. Such in his opinion is the value and such the inadequacy of the '*Weltanschauungsphilosophie*.'[2]

[1] *Op. cit.*, pp. 321 ff.

[2] *Ibid.*, pp. 325–341.

The other tendency which must be shown inadequate is empiricism or naturalism. Empiricism and naturalism amount to the same thing in Professor Husserl's opinion, for the empirical method can explore only the spatio-temporal realm called nature, and that realm can be revealed only by the empirical method. Natural scientists are prone to this tendency because the object upon which their attention is concentrated is the world of nature spread out in space and time, and because the method in which they have diligently trained themselves, and which they have applied with marvellous success, is the method of observation and experiment, interpreted by the principles of inductive logic and applied mathematics. When therefore they turn to philosophy they seek to fit all realities into the space-time schema, and to validate all principles by empirical methods.

In particular, the empiricist finds logic and mathematics indispensable to science, and therefore tries to find an empirical basis for them. But this endeavor breaks down the empirical method and fails to establish the needed principles. We hear that mathematics is the product of the whole experience of the race, crystallized in our modes of apprehension; but physics and other natural sciences dare not appeal to any such experience. Again we hear that mathematics is validated by experiments in imagination; but no one would dare appeal to such experiments in physics.[1] The empirical method is therefore debased by the attempt to extend its application.

Moreover, the principles of logic and mathematics have that universality and necessity which Kant emphasized, while the results reached by empirical methods are at best approximate and probable, however close the approximation and however high the probability. It is therefore futile to seek an empirical basis for logic and mathematics.[2]

Empiricism likewise reduces consciousness to a natural phenomenon. It makes little difference whether it adopts materialism, or treats consciousness as an epiphenomenon, or whether, as in the case of Mach, both physical and mental facts are regarded as complexes of 'sensations.' In any case consciousness

[1] *Op. cit.*, pp. 295–300, and *Ideen*, section 25.

[2] P. s. w., p. 298.

is regarded as a series of phenomena, each item of which is dated in objective time and conditioned by a physical body; it is thus incorporated in the general spatio-temporal realm of nature, and subjected solely and completely to natural laws. On this basis the principles of logic, mathematics, and the value-sciences can appear only as 'laws of thought' in the sense of psychological generalizations describing the actual course of the stream of consciousness, mere '*Spielregeln des Bewusstseins.*' But if consciousness is only one natural phenomenon among others, how can the rules of its own private game reveal to it the surrounding world? Questions as to the validity of logic, mathematics, and the empirical method affect natural science as a whole, for those disciplines are presupposed by natural science; therefore such questions cannot be solved within the frame of natural science by natural-scientific methods. Consciousness must therefore be admitted to be something more than a natural phenomenon, since it grasps principles which transcend the realm of nature and the methods of natural science. Unless that is the case we cannot even have natural science, for it presupposes logic and mathematics.[1] On these grounds also empirical naturalism is adjudged an inadequate philosophy.

Empiricism is a wholesome tendency in so far as it demands that all theory should rest upon direct 'seeing' of realities, rather than upon tradition and prejudice. But it is arbitrary and dogmatic in its assumption that all 'seeing' must be of the empirical type, namely the perception of individual facts localized in space and time. Logic and mathematics rest in fact upon quite a different kind of 'seeing.'[2]

Empiricism bars the way to some necessary advances in science. No empirical science can develop rapidly and securely until its proper basis of non-empirical principles has been found. Thus the physical sciences were stagnant for a long time before Galileo and Descartes gave them a great impulse by providing them with the proper mathematical vehicle. In our own day psychological, social, and axiological sciences are in the doldrums for lack of a

[1] *Op. cit.*, p. 300.

[2] *Ideen*, section 19.

sound *a priori* basis. Yet empiricism cries down all attempts to discover that basis.[1]

Neither the anti-scientific methods of the *Weltanschauungs-philosophie* nor the pseudo-scientific methods of empiricism can give us the scientific philosophy we need. A truly scientific method, Professor Husserl maintains, will lift us above personal 'standpoints' to a plane of impersonal objectivity. Such a method will attain definitive results which can be formulated in textbooks and learned. Every science, to be sure, has controversial questions on its borders, but it is the mark of a science to possess at least a nucleus of definitive results, which command the assent of all competent persons trained in the science. When Kant said that we can learn philosophizing but not philosophy, he betrayed the unscientific character of philosophy. For a science can be learned—not passively, to be sure, but by rethinking its conclusions in logical order.

The true method of philosophizing, which will slowly but surely yield definitive results, is not easy to find—else it would have been found and practiced long ago. It requires a radical modification of our ordinary way of looking at things, a refocusing of our mental vision; this Professor Husserl expresses by saying that we must get a new *Einstellung*. His name for the needful *Einstellung* is 'phenomenological,' and the science which it yields is 'phenomenology.' Phenomenology is the fundamental philosophical science, all other philosophical disciplines being dependent upon it for their ultimate clarification and validation.

To lead the reader from his ordinary *Einstellung* or mental focus to the phenomenological *Einstellung* is the chief purpose of Professor Husserl's article in the first volume of the *Jahrbuch für Philosophie und phänomenologische Forschung*. We may set out from our ordinary natural *Einstellung*. In the natural *Einstellung* a spatio-temporal world *is found*. It is a world of inanimate objects, animals, and men, and the thoughts, feelings and wishes of the latter. Not merely the field of actual perception but the adjacent fields are at least vaguely felt as given. This 'horizon' of experience may be explored with

[1] *Op. cit.*, sections 9, 26.

varying success, but never exhausted. The past and future are likewise apprehended as an inexhaustible field for exploration, environing my present experience. It is this natural world with which my intellectual, emotional, and practical activities are chiefly concerned. But I can also turn my attention to arithmetic and a new world stands before me. The world of numbers has no place and no time, and is therefore no part of the natural world. The same applies to kindred abstract sciences. Again I am aware of other selves, who like me can explore the world of nature or the world of numbers, so that they and I live in the same inclusive world.[1]

To attain the phenomenological *Einstellung* two steps or reductions are necessary. The first step is to abstract from our belief in the whole realm of realities just described: physical things, mathematical entities, the plurality of selves. We must focus our attention upon consciousness as such. Not physical things are to be our theme, but perceptions of them, thoughts of them, desires for them; not numbers but the thought of number; not the numerous real selves but the experience in which selfhood is felt or recognized. We are not asked to doubt or deny the reality of these objects; that might be impossible; but we can refrain from using our beliefs about them as premises in our investigation. We need not delete such beliefs, but to attain the phenomenological *Einstellung* we must 'put them in brackets,' which is Professor Husserl's favorite figure for the process. With our first step, then, we have bracketed the world of objects and fixed our gaze upon a realm consisting solely of consciousness.[2]

Our second step should cause no difficulty to students either of scholasticism or of Messrs. G. E. Moore and Bertrand Russell. We are not to describe consciousness as a realm of individual being but to analyze the essences or universals of its modifications. Not *this* perception-of-a-reading-lamp-with-a-green-shade is the object of our interest, but perception-of-a-physical-thing and color-sensation and awareness-of-use. The universals are not a narrowly limited set, such as Plato and Aristotle seem to

[1] *Op. cit.*, sections 27–30.

[2] *Ibid.*, sections 31, 32, 50, 51.

have had in mind, but are as numerous as the nuances of reality. Universalization is therefore always possible without loss, for every bit of individual being has its essence or complete nature. We need only to shift the focus, abstracting from the individuality of the experience, and the essence or universal stands before our mental vision.[1]

It is to be noted that phenomenology does not coincide with 'science of universals' in general. Logic, mathematics, and other non-empirical sciences are also sciences of universals, or in Professor Husserl's terminology 'eidetic' sciences. In the phenomenological *Einstellung* these sciences are bracketed just as much as physics and chemistry. Phenomenology is the eidetic science of pure consciousness.[2]

As an example of phenomenological analysis I propose to state Professor Husserl's view of the way in which physical objects are presented to consciousness. I choose this because it will throw light upon Professor Husserl's relation to realism and idealism. We may, he maintains, rightly say that a given table is square in shape and a uniform brown in color; these are its actual qualities. But in consciousness these qualities are modified according to the position of the observer, the illumination, and other factors. We know the table is square because of the various trapezoidal images we get in viewing it from various directions. We know that it is uniformly brown because it appears darker and duller in the shaded portions. The uniform objective color-quality is represented by a wide variety of color-sensations. These varied appearances Professor Husserl calls *Abschattungen* and he extends the term to the varied appearances of all other physical qualities as well. No quality is to be identified with any of its *Abschattungen*. They belong to different genera: the qualities are essentially spatial; the *Abschattungen*, being phases of consciousness, are non-spatial. The quality is precisely that identical something of which we become aware through experiencing the system of *Abschattungen*. The quality is 'transcendent,' because it can never be an actual component

[1] *Op. cit.*, sections 2–7.

[2] *Ibid.*, section 33.

of consciousness. But it is erroneous to suppose that the quality which transcends our consciousness might be immanent in some other consciousness, say God's. It is in the very nature of such qualities that they can be perceived only in and through a system of *Abschattungen*.

A full-fledged physical thing is that which has a system of physical qualities varying according to laws. These qualities include both the so-called primary qualities and secondary qualities. That distinction has been modified by modern physics so that only mathematical properties are recognized as primary. But color and so forth are also objective in the sense above described, though they happen not to serve the theoretical purposes of physics. No physical object can be known with absolute certainty, for its various qualities present themselves in a series of *Abschattungen* that is essentially infinite; the meaning of a series of *Abschattungen* may be cancelled by subsequent experience, as when an apparently open box turns out to have a glass cover, or the supposed ghost turns out to be a hallucination. It is therefore always technically possible to doubt the existence of a physical object, since the evidence for it can never be all in. The whole natural world is therefore open to the Cartesian doubt.[1] The analysis therefore shows that physical objects are revealed only through the system of *Abschattungen* in consciousness, and that that revelation is never complete.

So far Professor Husserl's doctrine seems realistic. Selves, physical things, mathematical and logical entities, seem to be treated as coordinate forms of reality. The assertion of the inalienable transcendence of physical things sounds especially realistic. In his earlier work, the *Logische Untersuchungen*, the resolute rejection of Neo-Kantian formulations and the general trend of the discussion seemed realistic. But here the argument suddenly takes a Berkeleyan turn; we learn that pure consciousness is the only absolute reality, and that all else, however 'transcendent,' is dependent upon it.

No object, he assures us, is such that consciousness does not concern it. All objects are part of the horizon of consciousness.

[1] *Op. cit.*, sections 41–46.

If not experienced, they are at least *experienceable*. No mere logical possibility of their being experienced is meant, but a possibility evidenced by the actual experience of objects bound up with the objects in question. Nature depends on consciousness, not consciousness on nature.

The whole realm of nature might be annihilated without annihilating pure consciousness. That is, the course of experience might cease to cohere in such a way as to reveal persistent spatial objects, a plurality of selves, and so forth; in that case the assertion of a natural world would fall to the ground. Pure consciousness would remain, although modified by the disintegration of those coherent sequences of perception which constitute our-experience-of-the-world-of-nature. Pure consciousness is therefore independent of the natural world and cannot be conditioned by it. Pure consciousness has no spatio-temporal environment and enters into no causal relations.

On the other hand, the whole realm of nature, with its physical objects deployed in space and time and subject to causal laws, is dependent on pure consciousness, for it exists only as that which consciousness posits on the basis of its coherent experiences; beyond that it is nothing.[1] Even the plurality of selves is similarly dependent. The states-of-consciousness of this or that self are facts correlated with the processes of a particular living body. A state-of-consciousness proclaims its existence not only through the introspection of the moment, but through the behavior of the organism, through memory, and so forth. Like a physical thing, it is posited on the basis of manifold experiences, and correlation with the organism is indispensable to this process. Without the experiences which lead to the recognition of a plurality of organic bodies, the pure consciousness would not conceive itself as split up into a plurality of selves. "*Ohne Körper, keine Menschen*" (without bodies, no human selves); but without pure consciousness, no bodies.[2]

In this idealistic train of thought the student of American Neo-Realism will readily recognize the process which Professor

[1] *Op. cit.*, sections 47. 49. 51.

[2] *Ibid.*, sections 53. 54.

Perry has stigmatized as the fallacy of initial predication. Nature is posited by consciousness on the basis of coherent series of perceptions; therefore nature exists only in so far as it is thus posited: its being is being-rightfully-posited. The initial aspect of being-posited is taken as definitive and exhaustive. This is the whole argument; whatsoever is more than this is merely solemn asseveration.

The chief merit of Professor Husserl's work lies in its patient exploitation of the direct scrutiny of the contents of consciousness. Neo-Realism has recognized this as the primary source of knowledge but has treated it rather left-handedly. Mr. Bertrand Russell repeatedly refers to 'inspection' but is rather apologetic about it, and uses it only as a springboard for discursive and dialectic leaps. Professor Marvin regards perception in a broad sense as basal but does not extensively explore it.[1] Professor Holt's bold theory of secondary qualities would collapse if it were not for such data as the introspective continuity of the quality 'roughness' with the experience of succession.[2] Yet he is habitually distrustful of introspection. Professor Perry's theory of the self trusts introspection for the rejection of the self as a simple active entity.[3] But 'general observation' and discursive analysis are his preferred methods. Now a philosophy is bound to be top-heavy and instable so long as it neglects its acknowledged foundations.

In this respect Professor Husserl furnishes a needful corrective supplement to Neo-Realism. To take a concrete instance, compare Professor Husserl's analysis of the 'transcendence' of physical objects with Professor Perry's light-hearted assertion that "Neptune may become my idea."[4] Professor Husserl may be wrong in holding that *Abschattungen* can exist *only* in consciousness and that physical qualities have a unique relation to them of being revealed in them. It may be that physical

[1] *The New Realism*, pp. 64 ff.

[2] *Ibid.*, pp. 341 ff.

[3] *Present Philosophical Tendencies*, pp. 279 ff.

[4] *Ibid.*, p. 287; in fairness it must be added that Professor Perry also says (*ibid.*, p. 279) that "natural objects do not enter wholly into mind." How the two statements are to be reconciled does not appear.

qualities are organizations of *Abschattungen* (Mr. Bertrand Russell in *Scientific Method in Philosophy*); or it may be that *Abschattungen* are organizations of neutral entities (Professor Holt in *The New Realism*); it may indeed be that in one of these ways the mental and the physical intersect. But it requires little scrutiny of the data to see that a full-fledged physical object like the planet Neptune cannot bodily invade consciousness; only phases of it can do so; and the full-fledged physical object remains, from the point of view of consciousness, a construction.

The results of Professor Husserl's phenomenological analysis cannot be reproduced in a brief article. They are spread out at large in his *Logische Untersuchungen* and in his three-hundred-page article in the *Jahrbuch* previously mentioned. Their merits and defects can be appreciated only by a thorough study of the texts. Still I think that even on the basis of this brief exposition we may fairly point out certain general defects of his doctrine.

In the first place, Professor Husserl is concerned to vindicate the novelty of his undertaking, to establish an absolute distinction between phenomenology and any extant science. In particular he is concerned to distinguish it from psychology, for he once identified it with 'descriptive psychology' and has been regretting this ever since.[1] (If it were allowed to be part of psychology we should have to admit the competence of psychologists to speak upon it. Professor Husserl is perfectly sure, however, that he has discovered a science upon which only he and his pupils are competent to speak.) But it should be noticed that the process by which the phenomenological *Einstellung* is reached is one of 'reduction,' in Professor Husserl's terminology. It is no captious verbalism to say that the process is one of *reduction* in all literalness, and to add that reductions cannot bring us to anything absolutely novel. The more carefully the process is studied the more evident it becomes that phenomenology is reached by *abstracting from*, *leaving out of sight*, *neglecting*, if you will, various features of the world which we ordinarily take account of. Now to be sure there is a certain economy of attention in leaving some facts out of account, so as to concentrate upon

[1] P.a.W., p. 318.

others; it facilitates a more thorough analysis of the facts selected. But the part can contain nothing which the whole does not contain, and a selective study can therefore reveal nothing which a sufficiently searching study of the whole field would not reveal.

To come now more definitely to the relation between psychology and phenomenology. Psychology, Professor Husserl maintains, deals with consciousness as the states of mind of various persons who are scattered about in nature and dependent on it. In every psychological judgment the whole natural world is presupposed.[1] Phenomenology, on the other hand, 'brackets' the whole natural world including the plurality of selves, and considers consciousness-as-such. Now what does this mean except that phenomenology *neglects* the physical and physiological conditions of consciousness, and that it *neglects* the distribution of consciousness among various conscious persons? And does not every psychologist do the same when he discusses the color-pyramid or the subjective distinctions between image and percept? What absolute novelty can be reached by abstracting from the conditions and distribution of consciousness? Evidently none.

The second reduction, by which we confine ourselves to an 'eidetic' study of pure consciousness, is likewise incapable of securing absolute novelty. By that reduction we no longer consider consciousness as a realm of individual being, a stream of concrete thoughts and feelings, but fix our attention upon the universal types of experience exemplified in it—upon 'thing-perception' in general, 'feeling of disgust' in general, and so on. Now whatever the relation of universals and particulars may be, I think the reader will admit that we are entirely dependent on particulars for our cognition of universals. A simple (*i. e.*, not yet analyzed and perhaps unanalyzable) universal can be known by way of acquaintance only if we are acquainted with an example of it. For instance, clarinet-quality of tone can be known by acquaintance only if we have heard individual clarinet-tones. We might indeed 'describe' it to one who had never heard a clarinet as 'similar to the tone of a flute but more like the human

[1] *Op. cit.*, p. 299.

voice than a flute is'; but that would surely introduce nothing absolutely novel into his experience; he would know certain relations of the entity in question, and might be able to identify a clarinet when he should hear it; but until he heard it he would still be curious as to what the exact clarinet-quality might be. A complex universal may be readily conceived if we are acquainted with examples of its components and of the requisite mode of organization. Thus one can readily conceive 'candle burning at both ends' without ever having seen such a phenomenon; yet one could not conceive it without experience of combustion, duality, ends, etc. Thus acquaintance with universals, whether simple or complex, presupposes acquaintance with examples of all that they contain. The transition to an eidetic study is therefore unable to introduce us to absolute novelties. It neglects the datings, repetitions, and so forth which characterize a field of individual reality. It concentrates our attention upon the similarities and dissimilarities of the various phases of reality, and upon their intrinsic natures. But those similarities, dissimilarities, and intrinsic natures are present *in* the system of particulars, and would be noted in an exhaustive description of it.

We may conclude then that neither the reduction to pure consciousness nor the reduction to eidetic analysis offers to phenomenology any object outside the scope of an exhaustive psychology. The only novelty it can claim is that of emphasizing a somewhat neglected aspect of psychology. That being the case, the results of psychology cannot be dismissed as irrelevant; nor can psychologists be denied a hearing on the ground that the matter falls outside their sphere.

Professor Husserl's reductions bring a gain through the concentration of attention upon the selected aspects of experience. But they also involve a loss which he does not seem to realize. He feels that phenomenology has nothing to gain by experimental technique. Such technique, he thinks, has value only for determining which persons have such and such experiences and under what conditions.[2] But in fact experimental technique facilitates introspection and helps us to concentrate upon the

[2] *Op. cit.*, pp. 304, 305.

intrinsic natures and similarities of phases of consciousness. It does this by removing distractions, and by presenting crucial instances. Such a crucial instance is the transition from 'succession' to 'roughness' which Professor Holt exploits in *The New Realism;* such an analysis can be made only under experimental conditions.

Another loss entailed by the phenomenological method is the loss of guidance from biological and physical principles. Could the James-Lange theory of the emotions have arisen without the guidance of physiology, or Professor McDougall's theory of emotions without the influence of general biology? Yet these theories have surely facilitated the introspective analysis of the emotions. To take an extremely controversial case, Professor Holt's theory of secondary qualities could not have arisen without the aid of physiology and physics. The bare possibility of its being true shows the need of reckoning with the *conditions* of consciousness even in our attempts at pure analysis.

The defects just mentioned could be more readily forgiven if we were convinced that Professor Husserl's analyses were free from verbalism, and based solely on a direct scrutiny of the facts. But often his method seems more verbal than genuinely introspective. Such a criticism cannot be validated by quotations torn from their context: some other critic might find that in the setting of the whole chapter the introspective meaning was clear, and that my cry of verbalism betrayed my lack of introspective power. I can only challenge such a critic to stretch his intuition to the demands of Professor Husserl's language if he can. There is a passage,[1] for instance, in which we are requested to *imagine* a process of abstract thought which flows freely and fruitfully, so as to arouse joy in the thinker. We are to view this in phenomenological reduction. We are to suppose further that during the joyous course of thought the thinker casts a reflective glance upon his joy, thus impeding the course of thought and making it less enjoyable. By the intuitive scrutiny of this example we are expected to verify the distinction between joy which is merely experienced and joy which is also noted or reflected upon.

[1] *Ideen*, p. 146.

The passage has still further nuances which I omit. Now it is characteristic of the words of a genius for introspection, such as James, that they cast an illumination into our hearts and we say, "So it is, though I never realized it before." The present writer receives no such illumination from the words of Professor Husserl in this and many other passages, and is forced to the conclusion that intuition is here eked out with verbal dialectic.

Professor Husserl's claim to have set philosophy upon the secure path of science seems to me not to have been made good. It is characteristic of science to take account of all facts relevant to its problems; I have indicated that phenomenology by its 'reductions' eliminates indispensable guiding-ideas derived from other sciences. It is characteristic of science to follow a consistent method; I have given my reasons for holding that in Professor Husserl's phenomenology, direct scrutiny is contaminated by discursive and verbalistic constructions. It is characteristic of science to clarify and simplify the problems with which it deals; Professor Husserl's writings are notoriously abstruse and intricate. It is characteristic of science to secure an ever widening circle of unsolicited converts (for where freedom of opinion reigns, anti-scientific forces always decline in influence, and any genuine science has a healthy growth); but Professor Husserl's doctrine has spread no more rapidly or spontaneously than many rival standpoints. I therefore conclude that Professor Husserl has not lifted philosophy from the plane of conflicting standpoints to the plane of objective science; he has merely added one more standpoint to the number.

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REVIEWS OF BOOKS.

The Idea of God in the Light of Recent Philosophy. (The Gifford Lectures delivered in the University of Aberdeen in the years 1912 and 1913.) By A. SETH PRINGLE-PATTISON. Clarendon Press, Oxford, 1917.—pp. xvi, 423.

This volume,—the publication of which, as the author explains in his brief Preface, has been delayed by "distractions and anxieties arising out of the war,"—is difficult to describe in summary fashion. At a time when philosophical novelties are rather too much in evidence, and when the serious student of philosophy has long since learned to discount new terms and phrases, Professor Pringle-Pattison has chosen to remain constant to his characteristic method of 'construction through criticism,' as he himself describes this. It is hardly necessary to remark that work of this kind is neither less nor more original than that which might seem almost the opposite in character. The great constructive works of philosophy are on a different plane, but they are on a plane by themselves.

As is usual, I believe, in the case of 'Gifford Lectures,' the First and Second Series consist of ten lectures each. While the subject-matter of the two Series is not sharply distinguished, the First Series is devoted, more particularly, to the philosophical foundation and the Second Series to the discussion of the more special problems of the philosophy of religion. Lecture I of the First Series is on "Hume's 'Dialogues concerning Natural Religion'," and Lecture II is on "Kant and the Idea of Intrinsic Value." Professor Pringle-Pattison's choice of Hume's posthumously published 'Dialogues' as a point of departure was probably suggested by the fact that the year the First Series of Lectures began to be delivered was the bi-centenary anniversary of the philosopher's birth. In any case, his interesting, if somewhat elaborate, analysis of Hume's subtle argument forms a natural introduction to Lecture II, which may properly be regarded as the real beginning of the 'critical-constructive' treatment. Here the author indicates his attitude toward Kant and modern Idealism,—an attitude which does much to determine the direction of the whole succeeding argument. In making the conception of value central for a theory of reality regarded as an organic whole, Kant was fully justified, and he thus became the true founder of the philosophical

method somewhat too vaguely called 'Idealism'; but, unfortunately, it was precisely in his ethical and religious philosophy that Kant made the greatest and, as it proved, the most unnecessary concessions to the artificial eighteenth century ideal. Professor Pringle-Pattison, though himself taking a profoundly ethical view of the world-problem, is not to be carried away by pious rhetoric or moral sentimentality. As he says by way of comment, "Job is not to serve God for naught after all" (p. 32). Indeed, it is morally necessary, according to Kant, to assume the existence of God, in order that we may be assured that Job—and also we ourselves—will be paid in full. But the objection is obvious: "Surely if, as Kant insists, it is wrong to treat a human being merely as a means, it must be a false way of putting things to present God himself in this merely instrumental light—as a *deus ex machina* introduced to effect the equation between virtue and happiness" (p. 34). Kant's own questionable procedure, however, did not permanently hamper Idealism. "This conception of intrinsic value as the clue to the ultimate nature of reality is the fundamental contention of all idealistic philosophy since Kant's time" (p. 38). Not only so, as regards Kant's immediate successors in Germany; but "it becomes still more markedly the watchword of Idealism in the long duel with an encroaching Naturalism, which was the engrossing concern of the nineteenth century, and which has shaped for us the specific form in which the theistic problem, as the ultimate question of philosophy, presents itself to the modern mind" (*ibid.*).

Lecture III is devoted to a discussion of the issues involved in this "Nineteenth-Century Duel between Idealism and Naturalism." This prolonged conflict, of course, followed the collapse, temporary at least, of the great German idealistic systems, and was a burning issue during the last half of the nineteenth century. Some of the factors that made for this controversy are plainly apparent. The unprecedented prestige of physical and, still more, of biological science almost inevitably led to the attempt to make science, in a more generalized form, take the place of philosophy. On the other hand, the opponents of Naturalism were not slow to point out that the problem of values could not be ignored permanently and that this might very well prove to be the ultimate problem. But Professor Pringle-Pattison shows that, on the technical side, the idealists among popular philosophers put themselves at a needless disadvantage by regarding the problem of values as a separate problem,—thus perpetuating the false Kantian antithesis between 'knowledge' and 'faith.' One might add that nothing could illustrate better the danger, from the side

of our spiritual interests, of taking a short cut to a desirable—or desired—end.

Frankly admitting that Kant's philosophy as a whole means much more than his hopelessly dualistic method might seem to imply, and that a good deal, at least, in the later development of German Idealism was profoundly significant, Professor Pringle-Pattison pertinently remarks: "Nevertheless, the broad fact remains, . . . that, for the average nineteenth-century thinker, it was the negative side of Kant's teaching—the critical limitation of knowledge to the world of sense-perception—that was of real significance; and the Kantian phenomenalism came to be identified with a somewhat facile agnosticism or relativism" (pp. 50, 51). This statement is justified by the author, not only by reference to Sir William Hamilton, Spencer, and Huxley, but to Lange, whose influential *History of Materialism* was an important factor in the 'return to Kant' movement in Germany. The "fine ethical undertone" of Lange's *History* is duly recognized; but his crude opposition of the 'real' (as defined by the mechanistic system of materialism) to the 'ideal,' all too vaguely imagined, is criticised as essentially unphilosophical. In this connection, the author quotes Martineau's highly significant remark: "Amid all the sickly talk about 'ideals' which has become the commonplace of our age, it is well to remember that, so long as they are a mere self-painting of the yearning spirit, they have no more solidity or steadiness than floating air-bubbles, gay in the sunshine and broken by the passing wind" (p. 53). In the latter part of the chapter, the dangers of anti-intellectualism are illustrated by reference to writers as widely and fundamentally different as Mr. Balfour and Mr. Kidd.

Lecture IV, "The Liberating Influence of Biology," is a natural introduction to Lectures V and VI, "The Lower and the Higher Naturalism" and "Man as Organic to the World." It is hardly necessary to say that, in his discussion of certain recent tendencies of biology, Professor Pringle-Pattison does not profess expert knowledge of the subject or adopt uncritically even the general position of Neo-Vitalism as a controversial standpoint. He merely welcomes what he believes to be the gradual breaking-down of the older form of the mechanistic theory, which assumed that all strictly scientific explanations in biology must be in terms of pure physics or chemistry. Moreover, he believes that the present undoubted revival of general interest in philosophy is closely connected with the larger ideals of the special sciences, as held by the scientists themselves.

Professor Pringle-Pattison's conception of "The Lower and the

Higher Naturalism," discussed in Lecture V, involves the distinction already suggested. This practically means the difference between 'levelling down,' in scientific or naturalistic explanations, and recognizing significant differences where they appear. The author urges throughout these Lectures that the latter method alone does justice to the principle of 'continuity,' assumed as a postulate alike by science and philosophy. It is to be noted that he says: "Epigenesis or creative synthesis in the sense indicated does not necessarily imply, so far as I can see, the pluralism and contingency with which Professor Ward identifies, or at least associates, it" (p. 95, note). As indicating his own position, he says: "The philosophical meaning of potentiality is, in short, simply the insight that, in the interpretation of any process, it is *the process as a whole* that has to be considered, if we wish to know the nature of the reality revealed in it. In other words, every evolutionary process must be read in the light of its last term. This is the true meaning of the profound Aristotelian doctrine of the Telos or End as the ultimate principle of explanation" (p. 106).

In Lecture VI, "Man as Organic to the World," Professor Pringle-Pattison attempts to employ the conception of 'continuity,' as he understands it, as a key to the nature of reality. Truth is to be found in the whole and the world is not complete or intelligible without man. The author says: "The so-called epistemological problem which obsesses modern philosophy, from Descartes and Locke to Kant and Spencer and the most recent magazine discussions . . . depends upon the presupposition of a finished world, as an independently existing fact, and an equally independent knower, equipped, from heaven knows where, with a peculiar apparatus of faculties. . . . Do what we may, our faculties get between us and the things, and we never know anything as it really is" (pp. 111, 112). On occasion Professor Pringle-Pattison is able to see the redeeming side of Naturalism itself, but he never manifests anything but impatience,—sometimes exaggerated, perhaps,—at what he regards as gratuitous 'subjectivism.' In fact, his impatience at what he more or less justifiably regards as unreal problems sometimes leads him to overlook or minimize problems that cannot be dismissed thus summarily. At any rate, however, he is right in one important respect,—perhaps the most important in the present connection. If knowledge is hopelessly undermined by scepticism as a result of the infection of 'subjectivism,' it is pure dogmatism to hold that 'values' will resist the same sinister disintegrating process. And he properly refuses to regard knowledge itself as an isolated, purely cognitive function. He

says: "It is . . . living experience, steeped in feeling and instinct with action, which is the real fact in which cognition, as such, is but an element" (p. 114).

Lecture VII, "Ethical Man: The Religion of Humanity," is devoted to a careful and not wholly unsympathetic criticism of Comte. While the author naturally finds the ideal of a 'Religion of Humanity' unsatisfactory, he does not rule the French philosopher out of court in the summary way that used to be too common. Instead of criticising Comte for not belonging to the orthodox development of nineteenth century thought, Professor Pringle-Pattison finds in him a good deal that illustrates the better side of nineteenth century popular philosophy, but more that illustrates the two characteristic elements of weakness in the thought of this period that he is emphasizing throughout,—agnosticism based upon a false 'subjectivism' in philosophical standpoint and method and a dangerous isolation of the ethical and religious problems. This criticism of method is developed with more special reference to the problems of religion in Lecture VIII, "Positivism and Agnosticism."

The two remaining Lectures of the First Series, IX, "Idealism and Pan-Psychism," and X, "Idealism and Mentalism," as the titles would imply, round out the author's treatment of the general problems of philosophy, in so far as they have an acknowledged bearing upon the religious problem. As might be expected, Professor Pringle-Pattison has little sympathy with some of the later developments of idealistic or spiritualistic philosophy. He says: "A spiritual philosophy which is sure of itself feels no temptation to deny or to minimize the mechanical aspects of the cosmos on which its higher life reposes. On the contrary, nature, as a realm of inviolable law, appears . . . to be the necessary condition of the life of intelligence and reasonable action" (pp. 178, 179). It is worth noticing that, in this respect, the author fully agrees with Professor Bosanquet, though he finds it necessary to criticise the latter's absolutistic monism in the Second Series, where he is more directly concerned with the essential problems of the philosophy of religion.

After criticising some of the less closely reasoned forms of 'pan-psychism,' like Clifford's 'mind-stuff' theory, the author comes to terms with the form of monadism developed in Professor Ward's later series of Gifford Lectures, *The Realm of Ends*. In particular, he criticises Professor Ward's emphasis of contingency as really basal in the ultimate spiritual order and his apparent acceptance of C. S. Peirce's suggestion that physical laws represent the result of the action

and reaction of psychic entities "in their struggle for the best *modus vivendi*" (p. 184). The author very pertinently urges that this fanciful theory appears to over-leap itself; "for surely the very consolidation of actions into habits depends upon the pre-existence of a stable system of conditions." And he adds: "What meaning can we attach to actions *in abstracto*, apart from any environment? The laudable desire to save spontaneity and freedom seems, by denying necessity altogether, to fall into the other extreme of pure chance" (*ibid.*). He concludes: "It is sufficient for the purposes of Idealism that nature as a whole should be recognized as complementary to mind, and possessing therefore no absolute existence of its own apart from its spiritual completion" (p. 189).

The concluding Lecture of the First Series, Lecture X, "Idealism and Mentalism," may be described as an attempt on the part of Professor Pringle-Pattison to disentangle Idealism, in the rather catholic sense in which he understands and holds the position, from 'Mentalism,' as the late Professor Sidgwick called it, viz., the doctrine that the being of things is dependent throughout upon their being known. And the author makes it plain from the start that he has in mind not only Berkeleianism or 'subjective idealism,' but also the traditional form of British Neo-Hegelianism. The unsatisfactoriness of 'subjective idealism,' when clearly recognized as such, is generally admitted; but the mere shifting of the emphasis from the individual knower to the All-Knower does not really help matters. "Transcendental idealism is just Berkeleian idealism *in excelsis*, Berkeleianism universalized and applied on the cosmic scale" (p. 193). The criticism of T. H. Green which follows would be more damaging if it were more evidently consistent. Green is first criticised for holding that mind brings into being and maintains an order and harmony that would not otherwise exist in nature (p. 196); later we are told: "The formal Ego, which is all that the mentalistic argument yields, is of no real account." And the author asks: "What difference does it make whether we regard nature as existing *per se*, or insist that all her processes are registered in a mind, if that mind is nothing but such a register or impartial reflection of the facts?" (Pp. 199, 200.) Something, perhaps, might be said for either criticism of Green, particularly for the first; but the two go ill together, and the apparent suggestion, in the last passage quoted, that Green's theory really involves the fallacy of 'representative perceptionism,' is hardly worthy of so seasoned a critic as the author. He would have done better to hold to his original criticism that Green took too literally Kant's principle that 'the understanding gives laws

to nature.' But, however this may be, Professor Pringle-Pattison makes it abundantly plain that, according to his view, the true foundation of Idealism is to be found in our experience of values, rather than in theory of knowledge or metaphysics separately considered.

For the justification of this position, one must turn to the Second Series of Lectures. Lecture XI, "The Argument of the First Course," is merely or mainly a summary, as the title would indicate. Lecture XII, however, "The Criterion of Value: Its Nature and Justification," is evidently intended as the beginning of the author's constructive treatment of the more special problems of religion that remain to be considered in the Second Series. The reviewer must confess to his disappointment in this Lecture and the following one on "The Ideal and the Actual." At length we are face to face with the problem which Professor Pringle-Pattison regards as absolutely basal to philosophy and he explicitly accepts the principle, "that the nature of reality can only mean the systematic structure discernible in its appearances, and that this must furnish us with our ultimate criterion of value" (p. 225). In other words, he accepts "the criterion on which 'absolutist' writers like Mr. Bradley and Professor Bosanquet lay so much stress" (*ibid.*). But, instead of proceeding at once to the long-delayed exact statement of his own position, the author explains at considerable length,—as he did much more satisfactorily in his very able long review of the *Appearance and Reality*, which appeared soon after its publication, nearly twenty-five years ago,—wherein he believes Mr. Bradley has failed in applying his test of 'consistency' as determining the nature of the Absolute. For a trans-Atlantic reader, it is difficult to understand why Mr. Bradley's glittering paradoxes in the *Appearance and Reality* should have produced such a hypnotic effect upon British philosophers of his generation. In his *Ethical Studies* and his *Principles of Logic*, Mr. Bradley had done very important pioneer work, and many of his later articles, particularly some of those published in recent years and included in his *Essays on Truth and Reality*, are worthy of the most careful consideration; but, in spite of the universally admitted subtlety of the *Appearance and Reality*, one is inclined to wonder if this book has not done more to discredit Absolute Idealism in the minds of those not predestined to that way of thinking than all the polemics directed against British Neo-Hegelianism.

Lecture XIII, "The Ideal and the Actual," is hardly more satisfying. The author regards as particularly significant the existence

of ideals of perfect Truth and Beauty and Infinite Goodness in the finite mind. In fact, we are told: "The presence of the Ideal is the reality of God within us." He pertinently adds: "This is, in essentials, the famous argument for the existence of God which meets us at the beginning of modern philosophy—the argument from the fact of man's possession of the idea of a Perfect Being" (p. 246). But philosophy has had a long development since Descartes, and the 'facts' accepted nowadays have generally been pretty carefully scrutinized first. The early rationalists, following Descartes, nearly all assumed that we have the idea of a Perfect Being, just as they assumed that we have a practically intuitive conception of 'substance.' But the empiricists and others largely exorcised the spectre of 'substance' by the simple device of asking exactly what the term meant. The same test inevitably suggests itself to the present-day technical student of philosophy, when the idea of the Most Perfect Being is mentioned. What do we mean by that well-rounded phrase? Obviously our idea of God is no more adequate than it is, and examination tends to show that it is rather pitifully inadequate. It is playing with words to dogmatize about a Perfect Being, when we are unable even to explain what we mean by 'perfection.' No one wishes to have his opponent in a theological argument sum up the controversy by remarking (as in Professor Bosanquet's anecdote in the *Logic*): "Oh I see, my dear sir, your *God* is my *Devil*." If we have the idea of God at all,—and the reviewer would be the last to deny this,—it must have some content, however vague. And it will not do to start with a vaguely conceived type of values, conventionally accepted, and merely imagine this raised to the *n*th power. Even theologians are at last coming to agree that mere All-Mightiness does not constitute a proper ideal of God. In this connection it is only fair to remember that, if T. H. Green depends too much upon the conception of the Eternal Consciousness in his more ambitious epistemological and metaphysical speculations, he also gives, in the *Prolegomena to Ethics*, a most interesting and valuable explanation of the very gradual development of our concrete ethical and spiritual ideals. Professor Pringle-Pattison's criticisms of Green are sometimes well justified, but there is another and better side of Green's teaching that is unfortunately neglected in these Lectures.

Thus far the argument of the Second Series has, for the most part, been on the plane of enlightened common-sense rather than of technical philosophy. Lectures XIV and XV, "The Absoute and the Finite Individual," are both devoted to an elaborate and rather tech-

nical discussion and criticism of Professor Bosanquet's treatment of this problem in the last Series of his Gifford Lectures, *The Value and Destiny of the Individual*. The author singles out for criticism what he regards as Professor Bosanquet's 'curiously grudging' treatment of what he himself calls 'the formal distinctness' of selves or souls. The general trend of the criticism is expressed in the following passage: "It would seem . . . as if the unity with which the system concludes tends to abolish the plurality of centres from which it starts. Their individual and, so far, separate existence cannot, of course, be denied as a fact of experience; but it is represented as 'appearance' or illusion, due to the impotence of our finite point of view, and quite unreal 'from the side of the Absolute'" (p. 276). This, of course, is the conventional criticism of Absolute Idealism, but the details of Professor Pringle-Pattison's long critique are by no means lacking in originality and suggestiveness. At the same time, it is always to be remembered that both Series of Professor Bosanquet's Gifford Lectures are altogether more technical and more constructive than the present Series of Lectures by his eminent critic, and that, whatever may be the difficulties for the serious student of philosophy inherent in *The Principle of Individuality and Value* and *The Value and Destiny of the Individual*, they make a very different impression when viewed in the light of the system as a whole than when isolated and criticised from the standpoint of more conventional religious ideals.

Lecture XVI, "The Idea of Creation," is also rather disappointing. It ought not to take a whole lecture to explain,—or admit, however reluctantly,—that the theological conception of creation out of nothing can only become a philosophical conception by being transformed practically beyond recognition. Almost at the end of the Lecture, when expressing an unexpected degree of appreciation for certain sides of Professor Howison's rather fantastic philosophy of religion, Professor Pringle-Pattison allows himself to speak very carelessly on the subject of moral freedom. "He [Professor Howison] has clearly perceived that a self-conscious being is, by his very nature, raised above the sphere of efficient causality as that operates in a world of things. Such a being is inaccessible to force or action from without: nothing can be effected in a self except through the personal will of the agent himself. A person cannot be coerced, he can only be persuaded; and if he is effectually persuaded, his decision becomes the expression of his whole nature" (p. 319). This seems like a bad case of the type of ethical dualism that the author has criticised in Kant. It is true that merely physical categories, taken by themselves

as self-sufficient, are inapplicable to the moral life; but this does not mean that, as moral beings, we are disembodied spirits. No philosophical treatment of the moral life is intelligible that does not take serious account of our physical limitations. But this is not all: if it were not for the wholesome authority of enlightened public opinion, which, at times like the present, is capable of becoming almost a compelling power, the moral life would be a chaos. Moreover, as has often been pointed out, abstract and impracticable moral 'idealism' is likely to employ the very formulas and catch-words of 'philosophical anarchy.' There is a great deal in the moral and social as well as in the physical order that we 'consent to,' not because we are 'persuaded,' but because we must. It may be remembered that, when Carlyle was told that Margaret Fuller 'accepted' the world-order, he characteristically remarked: "Egad, she had better!"

Lectures XVII and XVIII, "Teleology as Cosmic Principle" and "Time and Eternity," logically belong together, as the author points out. While neither Lecture can be regarded as important from the side of philosophical 'construction,' the one on "Time and Eternity" is rather the best statement of the general problem for the intelligent but non-technical reader with which the reviewer is acquainted. Lecture XIX, "Bergsonian Time and a Growing Universe," may fairly be called a somewhat more technical appendix to the immediately preceding discussion. It is better criticism than a good deal that precedes, partly because more sympathetic, which is not to imply that Professor Pringle-Pattison by any means agrees with what are probably to be regarded as Bergson's 'conclusions.'

Lecture XX, the concluding one, on "Pluralism—Evil and Suffering," first passes in review Dr. Rashdall's theory of a limited God, Dr. McTaggart's Absolute as a society of self-existent persons, and William James's 'Pluralistic Universe.' The author then turns to the problem of evil and suffering and devotes what seems rather unnecessary space to the somewhat antiquated, though always interesting, arguments of Hume and J. S. Mill on that subject. Hume's position is too much that of the eighteenth century to be exactly relevant, while the author's interpretation and criticism of Mill's arguments keeps too close to Mill's inherited hedonism and does not take sufficient account of his perhaps unconscious, but sometimes pronounced, leaning toward the ideal of self-development as an end in itself. Since Mill's "Manichæan hypothesis of two warring principles of good and evil" (p. 401) is criticised in rather the conventional way, he might at least have been given more credit for introducing the frank discussion of the ideal

of a finite or limited God. The philosophical difficulties of this position are doubtless very considerable and perhaps fatal; but one can hardly fail to recognize that the whole discussion has tended to preserve and emphasize that higher anthropomorphism which must be preserved, unless the idea of God is to be 'merged and transmuted' into the idea of a too abstractly conceived Absolute. The problem of Evil can hardly be solved, or even made intelligible, by any method of 'absent treatment,' after the amiable manner of Christian Science.

Prefacing his own brief concluding treatment of the ultimate problem, Professor Pringle-Pattison frankly says: "To reach any credible theory of the relation of God and man we must . . . profoundly transform the traditional idea of God" (p. 399). In particular, he urges: "We must remember how closely the associations of oriental monarchy have wound themselves round the God-idea. The popular use of 'the Almighty,' as an appellation of the Divine Being, may be said, with some truth, to perpetuate the pretensions of these potentates and the flatteries of their helpless subjects. In itself, the predicate completely lacks the element of value, for it simply means able to do anything" (p. 403). And he continues: "The traditional ideal, to a large extent an inheritance of philosophy from theology, may be not unfairly described as a fusion of the primitive monarchical ideal with Aristotle's conception of the Eternal Thinker" (p. 407). As against this philosophically and spiritually unsatisfying ideal, Professor Pringle-Pattison turns to the ideal of 'the suffering God,' characteristic of the mythologies of a number of the higher forms of religion. He objects to the mechanical procedure of popular Christian theology, which conceives of Father and Son as practically two distinct personalities,—"the Father perpetuating the old monarchical ideal and the incarnation of the Son being limited to a single historical individual" (p. 409). After these rather unconventional preliminaries, the author emphasizes as central to any universal scheme of values the traditional Christian ideal of self-sacrifice,—"in the Pauline phrase, dying to live, in the words of Jesus, losing one's life to find it." Hence he infers the existence of "a God who lives in the perpetual giving of himself, who shares the life of his finite creatures, bearing in and with them the whole burden of their finitude, their sinful wanderings and sorrows, and the suffering without which they cannot be made perfect" (p. 411). This is not a solution of the metaphysical difficulties so long dwelt upon; but one can hardly quarrel with the eminent Lecturer for defining the living source of all values, as he conceives it, and calling this ideal God.

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A Realistic Universe. An Introduction to Metaphysics. By JOHN ELOF BOODIN. New York, The Macmillan Company, 1916.—pp. xxii, 412.

"This volume on metaphysics is the sequel of a volume on the theory of knowledge, entitled 'Truth and Reality,' which was published in 1911. The two volumes furnish a survey of the field of general philosophy from the point of view of pragmatic realism" (p. vii). A large portion of the book has seen light before in the form of articles, and, while the contents do betray occasionally the character of a collection, Professor Boodin insists that his volume is in no sense a compilation of articles, but that it was early conceived as a systematic unity.

It is in fact an outline of a metaphysical system, motivated by a desire to translate the age-long problems of metaphysics into terms of real present human issues. This desire, evidenced throughout the book, inspires the author's formulation of his procedure: "As applied to metaphysics the pragmatic method means that we must judge the nature of reality, in its various grades and complexities, by the consequences to the realization of human purposes, instead of by *a priori* assumptions" (p. vii). The plan of the book is stated twice: in a rhapsodic prospective chapter entitled "The Divine Fivefold Truth," and in a more technical retrospect, "The Five Attributes," which closes the book. In opposition to Spinoza, whom he characterizes as an idealist in ethics and a materialist in epistemology, Professor Boodin proposes a new doctrine of attributes, using the classic term to designate the ultimate types of difference which reality makes to our reflective conduct. He recognizes five such ultimates: Being, Consciousness, Space, Time, and Form. The five parts of the book are concerned with this fivefold analysis of the universe.

The two classic metaphysical hypotheses, of independent substances and of the idealistic absolute, appear to the author inadequate; in place of any such "everlasting fixtures" he stresses process as the real ultimate. Substances are mere abstractions of the relative uniformities and constancies observed in the stream of processes. The absolute of idealism is an hypostatization of finite human experience. The real world is not a world of static entities and things-in-themselves. There is no substrate except the interlocking, interdependent energies." (p. 54). Nor are the energy-systems themselves to be hypostatized. "Energy is what it does. Any other assumption is suicidal at the outset" (p. 33). Professor Boodin calls his position Pragmatic Energism. Each energy system involves certain variables, a certain

form or organizing relation, and recurrence (the pragmatic equivalent of 'substance').

"Reality is what it manifests itself to be in its varying contexts" (p. 54). But this does not mean for Professor Boodin that experience comprehends reality. Experience is not self-sufficient. Actual experience does not account for its own continuity, either in space or in time; and 'possible experience' only hides the problem: "If it means anything when pressed home it is that experience sometimes leans upon processes which are not experience" (p. 17). Things are objective not in that we do acknowledge them but in that we *must* acknowledge them. "Human nature as cognitive does not create qualities, though it is an indispensable condition for their significance" (p. 79). The failure to recognize this distinction Professor Boodin regards as a characteristic sin of idealism. Between dogmatism and absolute agnosticism he proposes relative agnosticism. We do not know all the properties of things; yet our knowledge is of the real, so far as it goes. The distinction between primary and secondary qualities is not a distinction between the real and the apparent; the basis of the distinction is instrumental and relative, not absolute. What is primary for one purpose may be secondary for another purpose. The test is always pragmatic. "Qualities must be considered as objective, if they enable us to identify and predict the things with which we must deal" (p. 87).

The second part of the volume is devoted to the problem of Consciousness and Mind. The author objects to the definition of consciousness in terms of cognitive meaning or logical relations. Consciousness does not create meaning; we do not create or add to the meaning of Homer or Euclid by becoming conscious of them. Nor is consciousness to be regarded as a relation between terms figuring within or without the field of experience. It is a fact over and beyond relations, whether logical or energetic. It is not energy, but it makes energy aware of itself as meaningful; it is not a relation, but is bound up with the subjective significance of relations. By stating consciousness as an independent variable, an ultimate non-energetic fact, Professor Boodin hopes to retain the simplicity of materialism without the contradiction of trying to convert energy into non-energy, to save the duplication of parallelism, and to accomplish the intent of the interaction theory "by showing the energetic character of the conative processes, their efficacious relation to the other energies of nature, while we get rid of the absurdity of having a non-energetic consciousness interact with an energetic world" (p. 129).

This emphasis upon consciousness as an independent non-energetic variable while it cuts into materialism on the one hand, cuts into subjective idealism on the other; for the existence of mental processes is as little dependent upon our consciousness of them as is the existence of material processes. "Consciousness and mind are conceptually separable facts" (p. 132). We no more make our mind by becoming conscious of it than we make the mind of Homer, or the processes of any other energy system, mechanical, electrical, organic, or social kinetic. Electricity makes certain differences to extended and ponderable processes; even so, mental processes are related to physical processes in ways which are investigable. These are problems of the interrelations of energy systems. But the problem of mind and matter is not the problem of consciousness. "Consciousness . . . makes only one difference to reality. Under certain energetic conditions it makes the difference of awareness" (p. 135). "It is not a link in the chain of causality, interacting with the events, physical or mental, but by its presence in the conative stream, the distinguishing of physical and mental becomes possible. . . . It is more like a medium, in which the events travel, than like a cause" (p. 138).

But, if consciousness is not mind, what then is mind? What is mental? Professor Boodin attempts to answer this question in Chapter X. Mind is conative constitution; "The will in its various stages is mental, and with it is bound up its pure affective tone of agreeable and disagreeable. The remainder of what we speak of as in the mind we must regard as physical" (p. 174). Conation and feeling are not themselves experiences. "Experience is only another name for the unique relation which we call interest; and I cannot see why the will is dependent for its existence upon noticing itself, or being noticed perhaps by another will, any more than the tree is thus dependent" (p. 174). We have no warrant for treating the self as an external entity, identical, unitary, free, or abstractly individual. The self is as constant as its activities and contents, as its ability to satisfy social expectancies; an identical self is an identical will. The self is ideally, but not actually, unified. Activity and freedom must mean, not chance, but the realization of aims in a world of predictable processes, a world in which purposive processes may control and make a difference to processes of impulse and impression. And mind "requires the unique tension of an intersubjective field, a conflict with another mind, to raise it to consciousness of itself" (p. 195).

Parts III and IV deal respectively with Space and Time. Serial

Space, Professor Boodin maintains, is indeed ideal, but the pure space of physics and astronomy is real. Geometrical construction is a matter of logic, to be conducted like any other free logical inquiry; yet even geometry, in continuing to assume free mobility as one of its few remaining axioms, presupposes pure space as objective to serial construction. If we conceive distance as real,—and we must, else things would have to coalesce or interpenetrate,—then pure space must be real. Space is no more subjective than motion or change, and its properties cannot be determined *a priori*, but must be ascertained in the same empirical way as we ascertain the properties of things. Time also is real and ultimate. We cannot treat it as an illusion, for how could the illusion of time and change arise in a static world? Time is not duration; the latter is indeed its antipodes, the eternity aspect of experience. "The time character is bound up with the coming and going, with the passing and novelty of the process" (p. 258). Serial time, like serial space, is ideal; but the serial character of time is secondary; its primary character is the fleeting, flying, evanescent character of experience, and that is assuredly real. To be sure, time is not the whole of reality, but an independent variable or attribute of it, just as stuff or energy is an independent variable. Between the Eleatic and Bergson, our author maintains the relativity alike of constancy and of flux.

The universe has been described so far as a process of energy systems, involving change and transformation (time), translation and free mobility (space), and awareness (consciousness). But what the author frankly recognizes as his most difficult problem still awaits us. For the question still remains: Does the process have direction, is there validity in the flux, does it disclose standards, criteria, order? This is the problem of Form, the fifth attribute of the author's universe. True realists in the past—Plato and Aristotle, Spinoza and Leibniz—have recognized the importance of form, but they have not been clear as to its nature. Form has been confused with activity; it has been set over against matter, and has accordingly been regarded as a quasi-causal agency entering into and transforming the world of things. But, for Professor Boodin, "Form has to to do, not with transformation, but with *formulation*—with the possibility of defining our situations in the terms of clear and distinct principles" (p. 330). Measured in terms of the world of sense-stuff, form is nothing. It is not itself structure or stuff or thought, but it determines the survival of the structures of stuff and ideals. So regarded, form shows itself to be eternal. Since it is not stuff of any kind, it is not subject to time and process; having no content, it is not itself subject to transmutation.

Professor Boodin's procedure at this stage (Chapter XVII: "Form and the Ought") is insistently reminiscent of Kant. One is moved to suspect that Ought and Categorical Imperative and Kingdom of Ends will here also be exalted to *Wolkenkukusheim* and that Lampe will once more have his Critique. For the question arises, how an Eternal Form can express the direction and validity of a transmutable world. If the author found earlier one of his arguments for the reality of time in the consideration that the very illusion of time and change would be inexplicable in a static universe, here he is confronted by a similar puzzle: How can the formal constitution of "the protean variations of evolution" be eternally constant? Already we had learned that flux and constancy are alike relative in this world of ours. But here the world of stuff and process is contrasted with the world of form; and, while "the universe does not indeed become pure form; the logical dualism remains," yet "pure form sets the final survival conditions of process" (p. 332). To be sure, as the author himself declares, it is only confused thinking which supposes that, in order to insure the reality of form, we must have a static universe. "To have truth and worth in the universe it is not necessary to be 'stoppers of the universe'" (p. 332). But, if the flux on the one hand and eternal form on the other, though contrasted, are to be regarded as different aspects of the same universe, a conceivable synthesis of their apparent incompatibility appears highly desirable. Indeed one is moved to inquire, in what sense form can be regarded as one of the 'attributes,' in the author's use of the term—"the ultimate types of difference which reality makes to our reflective conduct" (p. 391). What difference does Eternal Form make to our finite experience? The author answers: "Form is creative, but it creates not by production but by elimination. It is creative as the artist is creative, *i. e.*, by selection" (p. 333). If this means that form brings forth nothing new, but suppresses and annihilates much that is old, then it is hard to see what purpose is served by this notion of creativeness, or in what essential manner the author has improved upon the Aristotelian conception, which he criticizes, when he has substituted the negative for the positive agency of form.

Throughout his book Professor Boodin has been protesting against *a priori* assumptions and insisting upon the empirical observation of the plain facts. Here also he himself asks and answers the question: What evidence do we have for the existence of absolute direction in the finite structural world? "As we have developed the sense of extensity with complex instinctive coordinations to meet the reality

of space; as we have developed the sense of duration with complex structural adjustments for measuring the flight of the time-process; as we have developed the feeling of effort to symbolize energy, so we have developed the feeling for form with its tendencies and sentiments, and its sanctions in social institutions, to meet the demands of the universe upon us" (p. 334). But, if we are capable of meeting these demands of the universe, if experience does disclose to us the nature of reality, as process and as eternal significance, is not the language of experience, if not self-sufficient, at any rate somewhat more sufficient philosophically than Professor Boodin is ready to grant to the idealist? His own procedure is not invariably as incompatible with that of the objective idealist as his words may indicate. To quote only one example: "The concept of validity has a real basis only in a world which has form. If the process of the universe is merely a chance affair, no ideals can be enforced, or be binding, whether mechanical or ethical. Science in such a world would have no guarantee for its ideals of simplicity and unity any more than ethics for its ideals of worth" (p. 341). But is it not apparent that a world so conceived is a world in which experience with its ideal demands is genuinely instrumental, indeed a world which not only discloses its real constitution in the language of experience, but whose constitution itself is fundamentally experiential? To realists, pragmatic and 'analytic,' Experience seems to declare out of Professor Boodin's book: "When Me you fly, I am the wings."

The chapter on "The Identity of the Ideals" has for its thesis "that the ideals of life, of truth and beauty and virtue, are identical as regards form or the demands which they set to the concrete will" (p. 307). In Chapter XVIII, "Teleological Idealism," the author examines briefly the mechanistic, finalistic, and vitalistic theories of evolution, endeavors to combine mechanism and finalism, and devotes a section to the problem of Matter and God. If the reviewer only refers to the contents of these two chapters, it is not because he has not found them thought-provoking enough for longer discussion. Indeed Professor Boodin's whole book is sufficiently vital to invite criticism. It is in no sense a nondescript work, but has been conceived in honest genuine thinking and is therefore naturally involved in genuine and open issues. It is not invariably convincing, but throughout it stimulates philosophical thinking,—and perhaps, after all, nothing better can be said of an introduction to metaphysics.

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Elements of Folk-Pyschology. Outlines of a Psychological History of the Development of Mankind. By WILHELM WUNDT. Authorized translation by Edward Leroy Schaub. London: Allen and Unwin; New York: The Macmillan Company. 1916.—pp. xxiii, 532.

Unlike the author's larger *Völkerpsychologie*, which consisted in the main of a psychological interpretation of the several products of the folk-mind—language, myth and customs, art—each in turn, the present volume aims at a reconstruction from the psychological point of view of the cultural development of man himself. The reshaping of the material involves considerable change of emphasis; instead of the two volumes formerly devoted to language, the subject is here dismissed in twenty pages and is not carried beyond its beginnings; art is treated in connection with successive stages of the development; the chief stress is placed on myth, customs, institutions. The new main purpose and the more compendious handling of the subject-matter add to the interest; the book is bulky, but readable.

According to Wundt, man has passed through three principal stages on the way to humanity, the goal of which is still in the future. These three stages are those of primitive man, of the totemic age and of the age of heroes and gods. Among the most primitive races, he reckons the Veddahs of Ceylon, the South African Bushmen, the Bantus, the Hottentots, and the Negritos of the Philippines, but not the natives of Australia, who possess a relatively high degree of social organization. The characteristic of the primitive is its relative simplicity. The intelligence of primitive man is restricted to a narrow sphere of action, but within that sphere is not notably inferior to that of civilized man. He has few wants, his conditions of life are relatively stable, and he is in general peaceable and contented. The picture we get of him is the very opposite of that drawn by Hobbes. His only weapon is the bow and arrow. His constant companion is the dog. His morality is dependent on his environment. Where his life is free, he has few motives to immoral conduct in our sense of the word; his state might almost be called ideal. When he is hunted and hard pressed, he possesses no moral principles whatever. His characteristic beliefs are in magic and demons, the motives to which are found in the emotions aroused by sickness and death. With these beliefs are connected the beginnings of his art.

The totemic age is the period pervaded by the culture directly or indirectly dependent on ideas of the totem, now taken as a group name, now as an indication of ancestry, these ideas variously interplaying. They give rise to exogamy, to tribal division and organiza-

tion and to chieftainship as a regular institution. From the latter comes the political organization which culminates in the State, which thus appears as itself one of the last products of totemic culture. We have now also organized warfare and new weapons for its prosecution, migrations of peoples, trade and barter, the cultivation of the land by agricultural implements, the care and breeding of cattle. The animal, sacred at the beginning, becomes a work animal, its cult significance gradually vanishes, and the totemic era passes over into that of heroes and gods. The culture of this age is not as uniform as that of the age preceding. Wundt distinguishes three stages, the Australian, the Malayo-Polynesian, and the American and African. Each has features which, in Wundt's view, derive from a similar totemic basis, but there are also marked differences; thus, the Malayo-Polynesian mythology is peculiar in being largely celestial, and here the totemic basis has almost entirely disappeared.

The characteristic of the age of heroes and gods is the predominance of individual personality. This distinguishes the hero, whether of *Märchen* or of saga, whether legendary or purely mythical, from the little personalized subjects of earlier myths. The god is a fusion of hero and demon. Here first we have what Wundt thinks may properly be termed religion—belief in and worship of the gods. The culture of the age is marked by many changes in belief about the higher powers and about the soul and its destiny, and by corresponding changes in economic life and in society. Among its phenomena are the differentiation of classes and of vocations, the rise of cities, the founding of states, the development of political and military organizations and the growth of the institution and administration of law. Its relatively most distinguishing characteristic is art, as that of the preceding age was the satisfaction of wants, and as that of more fully developed humanity is science.

The trend of this whole movement is to develop the idea of man, of the whole of humanity, as the subject of culture, and to lead to an age in which this idea, "having come to clear consciousness, exercises an influence on the various phases of culture, and is entertained by a sufficiently large portion of mankind to ensure its permanent effectiveness." This age of the development to humanity, in which the most civilized part of the world now lives, has been especially conditioned by four great factors,—world-empires, world-culture, world-religions and world-history. The first have disappeared, the second and third remain. All together have powerfully influenced the growth of the historical consciousness and have given rise to various construc-

tions of the philosophy of history from Augustine down. Now history, Wundt holds, is really an account of mental life. Hence the direct approach to a philosophy of history is a psychological study of the development of mankind, aiming to discover the determining motives of historical life and its changes, and of interpreting these by reference to the universal laws of mind. The philosophical interpretation, which has to do with significance, thus rests on the psychological interpretation, that is, on folk-psychology, which seeks to discover the laws immanent in the process of man's development.

Such, in barest outline, is the most general course of the argument. The details are a complicated tissue of ethnological and historical data and hypothesis, which only an expert in this field as competent as Wundt himself can properly appreciate. Few possess his erudition combined with his psychological acumen. He has, besides, the skill to invest his larger constructions, partly perhaps by force of repetition of assumptions, with the grand air of plausibility. One feels that the course of human development may really have been pretty much as he describes it. Nevertheless, even a somewhat limited experience of human nature suggests caution. La Rochefoucauld said of human actions, they are like *bout-rimés*; we see the end-terms, but the meaning depends on the antecedents, which may be as various as you please. So, it seems, the very same phenomena of folk-lore and tradition may be explained by very various psychological motives. We all know the conflict of opinion regarding the origin of totemism. Wundt contends for a totemic age and considers it "highly probable" that the germs of almost everything in advanced civilization are to be found in it. He bases this opinion largely on the evidence of what he regards as survivals. "Surviving effects of totemic culture," he says, "are everywhere apparent." He mentions the sacred animals of many ancient civilized peoples, divination by the flight of birds and the examination of entrails among the Romans, and the Israelitic law which forbids the eating of the flesh of certain animals. But is it so certain that these are survivals of totemism? Must we assume that wherever an animal appears as possessing peculiar, and especially supernatural, significance, it is due to the fact that at one time it, or some other animal, was conceived as an ancestor? The human mind would seem to be sufficiently plastic to supply other motives. Why should not the race have developed along divergent lines and some branches of it not passed through the totemic stage, in the stricter sense of the term, at all? And there is another reason for caution in the book itself. There is not a single footnote from beginning to end

and even in the text scarcely any reference to authorities; in the rare cases where an author is cited, it is usually with reference to some opinion to be rejected. Unless, therefore, one happens to know the facts, it is impossible to tell whether what Wundt states as a fact is generally accepted as such. Occasionally, indeed, one happens to know the contrary, as, for example, that the pious Puritans of New England did *not*, as Wundt says they did, carry on a war of extermination against the red race (p. 111). Then, because perhaps of a sharpened sense for it under present conditions, we are struck by the frequency of the 'obviously,' 'doubtless' and so forth of the German professor in the presence of evidence that seems hardly to warrant the inference. Many illustrations might be cited, but one may suffice. On p. 220 there is the beginning of a section on "The Origin of the Fetish." On the same page, "the totemic origin of certain primitive forms of fetishes" is asserted as explaining the relation of the fetish and the psyche. On the page following we read of a restriction of the meaning of fetishism at the time of its origin, "which was *probably* totemic." This is more cautious. But then, on p. 227, we get the full-flavored modality; the fact, from becoming probable, has evolved to certainty, and we learn that "fetishism, in its genuine form, may *unquestionably* be regarded as a product of the totemic age." (Reviewer's italics.) The confidence of dogmatism begets the uncertainty of scepticism and the suspicion that Wundt's reconstruction of human history is, after all, a more or less ingenious hypothesis which will in turn give place to others resting on a securer foundation.

The translation is decidedly good, and a few changes would make it still better. The repeated use of 'transpire' for 'take place,' the occasional use of 'will' for 'shall,' the adoption of the vile verb 'to stress,' the solecism 'genericalness,' and the Teutonic 'will-acts' for, *anglice*, 'voluntary acts' or 'acts of will,' are disfigurements which can easily be removed in a second edition. The only noted misprint is on p. 178 (last line), namely, 'He knew' for (presumably) 'We know.'

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NOTICES OF NEW BOOKS

Kant's Teleologie. Door C. PEKELHARING. P. Noordhoff, Groningen, 1916.—pp. iv, 243.

The purpose of the author, as stated in the final pages of the book, is to show, first, that Kant committed a serious methodological error in neglecting to determine the characteristics of aim or purpose; secondly, that his attempt to systematize aims was foreordained to fail, since, as he himself states, everything in nature can be viewed as a means to an end; and, thirdly, that his principle of formal *Zweckmässigkeit* (in the *Kritik der Urtheilskraft*) led Kant into serious error, which would have been avoided if he had realized that this principle, instead of being an independent and coördinate principle, is simply a corollary of the principle of causation. In the *Introduction* the author submits an interpretation of aim or purpose, which, in his view, presents the following characteristics: (1) The improbability that the result is *accidentally* produced by the antecedents, (2) the improbability that the result is due to an underlying physical cause or group of physical causes, and (3) the fact that the result is of some value to some being (pp. 3, 4). That these characteristics may be possessed by processes to which we can not ascribe consciousness is genially admitted by the author; and the limitation placed upon the possible achievements of physical causes is in no wise reconciled with the doctrine (*cf.* pp. 108–112) that no limit must be placed upon these causes, since mechanical and teleological explanations simply represent parallel and harmonious points of view, after the manner of the 'double aspect' theory of consciousness and matter. This insight into the nature of teleology was made possible by the work of Kant, though he himself never attained to it. Alongside this doctrine of purpose the author offers an interpretation of 'explanation' which, as he contends, goes beyond Kant in that it makes his principle of formal *Zweckmässigkeit* entirely superfluous. Man has an *a priori* conviction of the permanent and indestructible identity of all that exists. From this conviction it follows that all change is logical in character, that the new occurrence is simply the old in a new form. In other words, the new is found to be identical with the old plus the cause of the change (*cf.* p. 125). This insight is gained by the discovery of the underlying laws of nature. By constantly increasing the scope of our generalizations the logical character of all change becomes increasingly evident. Since this procedure is based upon our antecedent *a priori* conviction regarding identity, Kant's principle of formal *Zweckmässigkeit* turns out to be merely a piece of useless machinery. But here again it is to Kant's achievement that we are indebted for the new outlook upon the subject. The author's evident admiration for Kant would be more impressive if he himself had escaped the rationalism in which Kant

remained entangled and if his book did not so completely ignore the more recent philosophical movements and discussions that have affected so profoundly the status of his problem.

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The Philosophy of William James. By TH. FLOURNOY. Authorized Translation by EDWIN B. HOLT and WILLIAM JAMES, Junior. New York, 1917.—pp. vii, 246.

Commentaries upon philosophers whose own writings are popular in style are likely to be superfluous. This book, however, is an exception. Many, though recognizing the charm of James's personality, and the brilliance of his work as a psychologist, have, on account of the unmethodical character of his philosophical writings, supposed that they contained no coherent system of thought. Professor Flournoy, on the contrary, has succeeded in discovering in them a fairly well articulated philosophy and James's permanent philosophical reputation will owe much to this interpretation by his Swiss friend. The English translation has the advantage of being able to employ James's picturesque terminology in his own language.

The development of James's philosophy, which "rests entirely upon his psychology" (p. 209), is largely the result of his naturally artistic temperament (which enabled him to understand and portray all kinds of minds) combined with the respect for scientific precision that he learned from Agassiz. The latter, too, taught him to despise abstract generalizations and to love the concrete and particular. His Swedenborgian environment early turned his attention to a serious study of types of religious experience, and Renouvier led him to reject monism. James's 'pragmatism' accordingly emphasizes particular facts and definite consequences, and reasons that since man thinks in order to live his ideas have a biological function by which their truth is to be tested. His 'radical empiricism' differs from traditional empiricism in regarding mental life as originally a 'stream of consciousness' containing both facts and relations. Truth is a relation between elements within the stream and has no transcendent reference. 'Pluralism' follows—since the stream contains great diversity of phenomena—and 'tychism'—since new creations constantly arise within the stream that viewed externally appear to be chance, and which internally are spontaneity and freedom. Here James anticipated Bergson. Such a view makes a systematic ethic impossible, but recognizes 'meliorism'; since the stream is plastic, it is always possible to improve it, *e. g.* by seeking a moral equivalent for war. Such a view of the world excludes an idealistic Absolute, but leaves room for a kind of theism. The phenomena of religious experience suggest the hypothesis of a supersensible consciousness (God or gods) exercising influence upon individuals through the subconsciousness.

Though always sympathetic, Professor Flournoy does not conceal some of James's more serious defects as a philosopher,—his superficiality, his pluralistic

difficulties with the 'compounding of consciousness,' and his failure to appreciate Kant, without whom Renouvier's and his own contributions might have been impossible (p. 62, footnote). He also points out that James finally learned to interpret Hegel sympathetically (p. 197).

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The Freudian Wish and Its Place in Ethics. By EDWIN B. HOLT. New York, 1915.—pp. vii, 212.

The title of this essay is misleading. It is not so much an application of Freud's doctrine of the 'wish' to ethical theory as it is a contribution to behavioristic psychology and the new realism. The author had previously developed a realistic theory of cognition, and in the first two chapters of this book he modifies Freud's conception of the 'wish' so as to make it conform with this theory of his own. He thus makes the rich empirical data of the Freudian school available for his own point of view, and for the new realism. He proposes to substitute the 'wish' for the 'sensation' as the unit of psychology. The 'wish' is defined as "*a course of action* which some mechanism of the body is *set* to carry out, whether it actually does so or not," which is "dependent on a *motor attitude* of the physical body, which goes over into overt action and *conduct* when the wish is carried into execution" (pp. 3, 4). The 'wish' is more dynamic, concrete, objective, and functional than the 'sensation.'

In subsequent chapters the writer attempts to describe the formation of character in the terminology of the 'wish.' He succeeds in showing that some phases of character formation can be treated in this way. As opposed to the 'sensation' of structural psychology, which is utterly useless in problems of this kind, he makes a clear case indeed. But is the 'wish' the best substitute for the 'sensation'? Many of Professor Holt's picturesque illustrations involve relations between purposing personalities in social situations, and he does not succeed in doing justice to these in terms of the 'wish.' Professor Holt really does not appear to have been thorough enough in carrying out his own behavioristic principles. For he strongly insists that 'behavior' must be distinguished from mere reflex action. Even though behavior may be a coördination of reflexes, to describe it in terms of reflexes alone would be to lose sight of the principles of coördination, and to regard it too atomistically; it would be to utilize the 'bead theory' of causation that physics has abandoned (pp. 156 ff.). On the contrary, it is necessary to study the *organization* of these reflexes (pp. 160, f.). But Professor Holt's own account of moral choice at times comes perilously near to being a 'bead-theory' of 'wishes.' To be sure, he often speaks of the 'integration' of 'wishes,' and effectively contrasts this with 'suppression' and 'dissociation' which he shows are pathological and immoral. But he says nothing very definite about this 'integration' except that it involves 'discrimination.' But who or what does the discriminating? The whole self? He ought to tell us how 'wishes' become coördinated or integrated into sentiments and a self. Though it would be unfair to condemn the 'wish' because

it has not been successfully applied to the larger problems of conduct in this popular sketch, it cannot be said that Professor Holt has succeeded in showing that the 'wish' is as promising a tool of analysis for the psychology of ethics as the 'instinct,' 'emotion,' 'sentiment' and 'self' of McDougall and Shand.

With the general spirit and purpose of the book the undersigned finds himself largely in sympathy. The moral life of course does somehow go on in the behavior of organisms, and to show how it develops from reflexes has been a momentous problem ever since Spencer. If Professor Holt can ultimately succeed in making moral conduct, including selfhood and personality, intelligible in terms of behaviorism he will achieve a splendid triumph both for the new psychology and the new realism. This book is at least extremely thought-provoking, and it is written in a facile style that makes it thoroughly delightful reading.

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Development of Personality. A Phase of the Philosophy of Education. By BROTHER CHRYSOSTOM, F.S.C. Philadelphia, John Joseph McVey, 1916.—pp. xxi, 379.

In spite of the fact that the protestant layman will find the terminology of this book somewhat strange he cannot fail to apprehend the sincerity and the learning of the author. The introduction by Thomas W. Churchill reminds the reader that religious teaching has gradually been excluded from the public school until many serious students are alarmed at the prospect of a generation unschooled in reverence and unselfish devotion. Of the five sections of this book, the first recites the Roman Catholic criticism of the secular training of teachers and maintains that the religious novitiate is a much better preparation for teaching and for the development of personality. The second section discusses religious faith and its value for the teacher. The third pursues the same subject in a chapter called "Biological Aspects of Faith" and in another, "Psychological Aspects of Faith." The substance of both these chapters is familiar notwithstanding the strange sound of the titles. In the fourth section another aspect of the training of the religious teacher is introduced in the study of the psychology and educational value of meditation. A final section is devoted to the superior training for social life which the religious novitiate secures through its "detachment from worldly goods, subjection of the flesh to the spirit, submission of the will to lawful authority, and all for God's sake" (p. 59). Probably a majority of those who read the book will be convinced by the temper and humanity of the author rather than by his logic. To the critical mind the practice of introducing a quotation to prove a point which in the nature of the case can be proved by experimental evidence only will be irritating but need not be taken too seriously. With the main thesis that personality is best developed by contact with religious attitudes very few would quarrel.

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The following books also have been received:

The Persistent Problems of Philosophy. By MARY WHITON CALKINS. Fourth Revised Edition. New York, The Macmillan Company, 1917.—pp. xxvi, 577.

Philosophy and the Social Problem. By WILL DURANT. New York, The Macmillan Company, 1917.—pp. x, 272.

The Essentials of Philosophy. By R. W. SELLARS. New York, The Macmillan Company, 1917.—pp. x, 301.

A Defence of Idealism. By MAY SINCLAIR. New York, The Macmillan Company, 1917.—pp. xvii, 355.

Mechanisms of Character Formation. By WILLIAM A. WHITE, M.D. New York, The Macmillan Company, 1916.—pp. v, 342.

The Life and Work of George Sylvester Morris. By R. M. WENLEY. New York, The Macmillan Company, 1917.—pp. xv, 326.

Nietzsche the Thinker. By WILLIAM MACKINTIRE SALTER. New York, Henry Holt and Company, 1917.—pp. x, 539.

Typical Recent Conceptions of Freedom. By GERTRUDE CARMAN BUSSEY. Greenfield, Mass., Press of T. Morey and Son, 1917.—pp. viii, 101.

The Self and Nature. By DEWITT H. PARKER. Cambridge, Harvard University Press, 1917.—pp. ix, 316.

Educational Psychology. By KATE GORDON. New York, Henry Holt and Company, 1917.—pp. vi, 294.

The Origin of Subjectivity in Hindu Thought. By ETHEL MAY KITCH. Philosophic Studies, The University of Chicago, Number 7. Chicago, The University of Chicago Press, 1917.—pp. 82.

Idées directrices de la morale chrétienne. Par CLODIUS PIAT. Paris, Félix Alcan, 1917.—pp. xii, 220.

Morale Kantienne et Morale humaine. Par F. SARTIAUX. Paris, Hachette et Cie, 1917.—pp. vii, 462.

La force et le droit. Par R. ANTHONY. Paris, Félix Alcan, 1917.—pp. 194.

Automatisme et suggestion. Par LE DR. H. BERNHEIM. Paris, Félix Alcan, 1917.—pp. xv, 168.

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Brahmadarsanam. By ŚRĪ ĀNANDA ĀCHĀRYA. New York, The Macmillan Company, 1917.—pp. xii, 210.

The History of Medieval Europe. By LYNN THORNDYKE. Under the Editorship of James T. Shotwell. Cambridge, the Riverside Press, 1917.—pp. xx, 682.

The Philosophy of Christianity. By BOTHWELL GRAHAM. Columbia, S. C., The R. L. Bryan Co., 1917.—pp. ix, 144.

A Social Theory of Religious Education. By GEORGE ALBERT COE. New York, Charles Scribner's Sons, 1917.—pp. xiii, 361.

Seneca ad Lucilium Epistulae Morales. Translated by RICHARD M. GUMMERE. In Three Volumes. I. New York, G. P. Putnam's Sons, 1917.—pp. xv, 464.

SUMMARIES OF ARTICLES.

Les problèmes de la langue à la lumière d'une théorie novelle. ALBERT SECHEHAYE. Rev. Ph., XLII, 7, pp. 1–31.

The point of departure for modern linguistics was a work by Franz Bopp, published in 1816, on the subject of the common ancestry of all Indo-European languages. He was followed by a group of romanticists who interpreted the history of language poetically. They believed that a primitive golden age when speech was pure passed into a period of decadence, which was marked by a disfigured and corrupted speech. The neogrammarians who flourished about 1875 treated language more scientifically, but their point of view was abstract; setting the 'matter' of language over against the work of the human mind, they were interested only in the automatic process by which phonetic sounds are transformed. In 1896 through a renewed interest in psychological interpretation language was connected with the human mind and will. This was an important step forward, but the specific nature of language had not yet been determined. The fundamental work in defining the meaning and relations of the science of language has been done by the scholar Ferdinand de Saussure. His theory is in a sense a correction and development of the theory of Whitney, the American student of Sanskrit, as it is expressed in his work *The Life of Language*. Saussure's doctrine can be stated in the form of seven theses or principles which constitute a logical development. The first distinguishes speech (*parole*), the individual, occasional, and particular expression of thought, from language (*langue*), the social institution, the sum of the conventions and laws imposed by a community upon speech to insure intelligibility. The second assigns language to the class of semiological institutions, or systems of signs, employed by a community; the third defines all semiology as essentially a science of values. Values are either natural or arbitrary; the signs of language are in the main arbitrary. The fourth insists that both the phonetic sounds of language and the ideas which they represent exist only as members of a closely coherent system of values, and that the relative character of signs in the system is more important than their intrinsic quality. These first four theses expound the *nature* of language; the other three deal with its *evolution*. The fifth states that because language contains much that is arbitrary and illogical, mind cannot easily modify its forms; but that, exactly because of this irrational element, it is easily affected by agencies which have nothing to do with the mechanism of language, as, for example, such an external circumstance as the war. In the sixth Saussure insists upon the distinction between two types of problems,—the synchronous, that is, those regarding organized systems and states of language, those of the traditional grammar, and the diachronous, problems concerning the changes and development of

language. Finally Saussure asserts that at any given moment the state of a language is like a position in chess, it is an accidental arrangement of its elements, its elements being the arbitrary combinations of sounds and ideas. The main contribution of Saussure to linguistics is the distinction he draws between arbitrary value given to language by the blind action of the community, and rational expression, which is the ideal of the living speech of the individual, in place of the old false distinction between the physiological and psychical elements in language. He has laid a secure foundation for linguistics, but his suggestions regarding the logical elements in language have yet to be worked out.

KATHERINE E. GILBERT.

The International Idea. E. CRAWSHAY-WILLIAMS. *Int. J. E.*, XXVII, 3, pp. 273–293.

I. *Nationality and Internationality.* Roughly, there are three points of view as regards internationality: the first conceives of nations as discrete, individual entities; the second dreams of an absolute union of all nations in one; the third sees the good points in both the other views, and conceives of each nation as a numerator of nationality standing over a common denominator of internationality. Nature can be relied on to preserve all the traits of national character peculiar to a people; man can bend his efforts without caution to the task of bringing about common, universal tendencies. The indispensable method of doing this is to get men to conceive the international idea, to think more internationally. There are two agencies which, when properly managed, will accomplish this end,—travel and education. By these the young mind will be given an international bent; it will be equipped linguistically, socially, and materially to avail itself of the advantages of internationalism. II. *War and Law.* Everybody believes it is better to settle international disputes by arbitration than by war; the misgivings are all on the practical side. In reality two things only are necessary,—faith and work. Faith does not mean blind or visionary trust, but a faith that recognizes that force is the ultimate argument of humanity, the sanction of law. The real question is, however, how can force be properly applied? Now 'rowdyism' in the community of nations will pass away just as individual 'rowdyism' has within nations. For this three things are required,—laws, a tribunal, and a sanction or force. The laws and the tribunal to make them, are the least difficult; the difficulty is to insure that the laws will be obeyed. The league of peace might give us assurance but for two defects, liability to intrigue, and lack of plans. A military power must be provided for, not made up of separate quotas from different nations, each reflecting the color and prejudice of its own people, but made up of men chosen and trained in such a way that their private interests are lost in their common work. In this way the world could be ruled by law with force behind it. III. *An International Language.* In order to bring about the ideal of internationalism, there must be an international language. There are many difficulties in the way of adopting an

ad hoc language like Esperanto, but an international council might be appointed to select one of the existing languages, and make it universal. Such a scheme could be put into operation in one generation, learned by each school child simultaneously with his native tongue, since children can learn two languages almost as easily as one. IV. *Standardization.* Overstandardization, or a dead level of similarity, would be an evil, but certain changes might be made in existing international differences with beneficial results: one standard of weights and measures might be easily universalized; the coinage of each country might be accepted in all; together with the national, international stamps might be used; and laws might be made more uniform. V. *An International Party.* One factor of importance for the international ideal is to have a great leader. "He is a matter for fate and for opportunity." But once here he must have a machine to work with, an international party. Suppose such a party were interested in the limitation of national armaments. It might ask the candidates for the various legislative bodies,—"Are you in favor of such and such a scheme for the limitation of armaments, *provided that the rest of the world agrees to the same?*" In this way it could appeal directly and forcibly to the people themselves. What would be needed for the establishment of such a party would be,—organization, men of ability, and money. These, joined to inspiration and hard work, could soon produce an international body the weight of whose opinion would be felt in all the council chambers of the world.

F. W. A. MILLER.

Bergsonism in England. J. W. SCOTT. Monist, XXVII, 2, pp. 179–204.

It is characteristic of Bergson that he attacks problems, not other people's solutions of them. There is thus a freshness about his work. What, he asks, can we make of the world as reported by the sciences? It seems apparent to Bergson that the universe was and is created by that spiritual energy which we see forcing itself forward in evolution. But how does such a view differ from that of T. H. Green? Both say that the universe is conscious and is the product of its consciousness; both that it is an active or willing, and not a conceptual, consciousness. Bergson appeals from the intellect; Green accepts it critically. They differ, however, in their doctrine of time. For Green the universe is finished, perfect; change, and therefore time, are appearance. For Bergson the world is ever new, ever changing; time is of its essence. Bergson cannot, therefore, affirm a *God*, enduring in perfection, or an *immortality* out of time. As for *freedom*, it exists for Green in the intellectual act of summoning the series of past spatial events into the present. Bergson denies space; for him there is no such series of events. The latter interpenetrate, and their interpenetration is time. By summoning ourselves together we feel this unity —we are free. Bergson's weakness here is in rejecting the intellect in his search for truth. Green trusts the instrument he is using. Yet Bergson is among the few who see the real issue regarding freedom. Freedom is not found in choice; it is the affirmation of the whole self in action. But in the space-

reality which Bergson denies is found the very stuff and fiber of the moral life. For him the moral point of view is, therefore, not real.

ALLEN J. THOMAS.

Rousseau's Doctrine of the Right to Believe. NORMAN WILDE. Mind, N.S., XXVI, 101, pp. 12–29.

The vicissitudes of Rousseau's life drove him into the enjoyment of nature which had been for him since his youth a wonderful dream-world and, at the same time, reality. This identification of his dream-world with reality is the explanation of his temperamental optimism which becomes explicit in his belief in God. To appreciate emotionally God's gloriously beautiful world was, for Rousseau, to pray. He believed in a future life wherein God's justice demanded that virtue be completed by happiness. He believed in the freedom of man's immaterial soul—a freedom based on man's spontaneous intelligence and power of choice. This spontaneity of the mind is illustrated both by Rousseau's theory of knowledge and his theory of conduct. Morality is merely the self-expression of a nature fundamentally good. He believes in a conscience which is "an innate principle of justice and virtue." This seems like the moral sense philosophy of Shaftsbury. His world-view is in outline identical with that of Deism. With Rousseau it is not a case of accepting an idea, but of being possessed by it. In his founding conviction upon theory and in his emphasis upon useful knowledge Rousseau approaches pragmatism. Still he is not pragmatic. He believes in an objective truth and contends only for the right to believe where objective and conclusive evidence is lacking. At such times he trusts himself to an 'instinct of the soul.' We could trust this instinct, he believes, if only we could get back to our original simplicity of vision. He is more akin to the faith philosophers than to pragmatism; but his real place is with the Platonizing intuitionists.

ALLEN J. THOMAS.

L'idéalisme positif. DR. GRASSET. Rev. Ph., XLII, 3, pp. 245–270.

Positive Idealism treats of the relations and laws which govern phenomena, but not of substances. The positive method, however, can be applied only to phenomena which are absolutely determined, and psychic phenomena, it is said, are not absolutely determined. How, then, is a positive science of man possible? The reply is that there are different kinds of determinism. Biological determinism differs from physico-chemical determinism. Human determinism, likewise, is different from general biological determinism. Human acts are determined, but not necessarily in a physico-chemical sense or even in a general biological sense. The positive method should be both introspective and objective. Positive Idealism should deal with the functions of living man, not with the anatomy of the dead body. Anatomically, man's brain is much like that of other animals, but functionally, it is very different. There are three orders of laws: physico-chemical, biological, and human. Man is subject, of course, to physico-chemical laws and also

to biological laws, which involve biological teleology. But man is also governed by special human laws. Man differs from the animals in intellectual superiority, and in the power to progress indefinitely. It is a law of humanity that each individual should aid in this progress. The reactions of man to biological laws are different from the reactions of animals. The acts of animals are necessary. In the acts of man there is a certain *contingency*, the possibility of direct intervention with the activity of the psychic neurone. As this function is composed of unknown elements, human decisions can not be foreseen. The act of man is free. Man obeys his biological laws only when he wishes to do so. Human liberty, however, is not the freedom of indifference, and the free act is not an act without a cause. As Duprat has said, liberty should be reconciled with determinism; but this determinism should be self-determinism, not determinism from without. Positive Idealism includes all that is susceptible of a positive treatment in psychology, ethics, sociology and the fundamental laws of logic. These laws are *a priori*, and indeed are the condition of experience. Yet they are established by introspection, which is a scientific method. Man is bound to his biological laws only by a moral obligation. Hence arise the ideas of responsibility and duty. These ideas can not be based upon general science. Only by considering the science of man apart from general science can we give to ethics a scientific basis. Metaphysics and religion remain outside the field of Positive Idealism. Positive Idealism does not deny the existence of metaphysics and religion. It admits the metaphysical psychic fact and the religious psychic fact, both of which it studies and utilizes. But Positive Idealism is not concerned with the origins nor with the conclusions of metaphysics and religion. Positive Idealism is positive because it is based on the scientific method; it is idealistic because it refers the object to the subject. There is an indissoluble unity of thought and action. As Fouillée has said, every state of consciousness is *idea* and also *force*. Positive Idealism has the authority and the value of a science.

MELVIN RIGG.

The Present Status of the Unconscious. GUSTAVE A. FEINGOLD. Monist, XXVII, 2, pp. 205–233.

The interests of those who write about the unconscious are various; those of one class of writers are metaphysical, those of a second, practical. A third group comprises psychologists who are seeking the 'what' and 'how' of subconscious activity. Leibniz was the first in his conception of the *petites perceptions* to formulate definitely the theory of the subconscious. Among modern writers there is a great disparity of opinion on the subject, largely due to the fact that the term subconscious is used in widely different senses. However, two general theories may be distinguished: the psychical and the physiological. Freud, Sidis, and Janet are the chief exponents of the former, declaring that the subconscious is dissociated consciousness. Pierce, Jastrow and Ribot are representatives of the latter, maintaining that the explanation of unconscious phenomena must be sought in neural processes. Freud suggests

that latent perceptions should be denoted by the term unconscious. He distinguishes two kinds of latent ideas, the 'fore-conscious' and the 'unconscious' which, meeting resistance, do not penetrate consciousness, however strong they may be. Sidis gives three definitions of the subconscious, the medico-popular, the metaphyscial and the scientific, respectively. According to him the subconscious may be of three types; desultory, synthetic or recognitive. What is commonly called subconscious he would call conscious, while that which is commonly called conscious he would call the self-conscious. The subconscious self is only a power of mental life. Dual personality is explained as follows: When a sufficient number of submerged moments of consciousnesses have accumulated they tend to become synthesized, to break forth into attentive consciousness. This secondary consciousness appears as a new and independent personality. Clearly Freud and Sidis have essentially the same viewpoint, neither offering a satisfactory solution in the light of the fundamental postulate of psychology,—namely, that 'every psychosis has its neurosis.' Sidis seems completely out of harmony with this postulate in his attack on the theory of unconscious cerebration. He maintains that the subconscious must be considered not as 'an unconscious physiological automaton,' but as 'a secondary self.'—In seeking for an explanation of instances of so-called intelligent actions which are unaccompanied by consciousness perhaps a better explanation than that of unconscious consciousness can be found. The case of a person who, absorbed in a magazine, yet picks his way safely through a crowded thoroughfare may be explained by the fact that strong association bonds have been formed in the past between the visual and motor centers so that response to visual impressions is discharged through the path of least resistance without reaching the association centers. The physiological theory of the unconscious, generally stated, holds that the subconscious is purely physiological. Münsterberg, Ribot, and Jastrow subscribe to this view. According to Irving King likewise, the subconscious must be interpreted in terms of neural dispositions. The subconscious is not to be conceived as dim consciousness but, in King's words, as a physical mass of neural dispositions, tensions and actual processes which are in some degree, perhaps, organized. Morton Prince conceives the problem of the unconscious as one of memory. Memory is composed of three factors—registration, conservation and reproduction. The conception of conservation as a physical residuum is based on the assumption that whenever we have a mental experience of any sort some trace is left in the neurones of the brain. The neurones have become organized into a functioning system corresponding to the system of mental states which accompany the original experience. Hence when the original ideas are reproduced in the form of memory it is because there is a refunctioning of the physiological neural process. Hypnotism, crystal gazing, and automatic writing can all be explained on this basis. In accordance then with the psychophysiological theory of memory we may define the unconscious as the brain residua,—the neurograms in which the experiences of life are conserved. At present there are, then, three theories of the unconscious before us; the psycho-

metaphysical, the psychophysiological with metaphysical leanings and the psychoneurological with scientific leanings. The first view, which is held by such writers as von Hartman, Myers, Delboeuf, and which declares that the whole universe is permeated with consciousness, can obviously lead nowhere. The second, held explicitly or implicitly by Freud, Sidis, Prince, Lloyd-Morgan and Janet, maintains "that there is consciousness in all organisms, only it is not conscious of itself." The third which asserts that neurological modifications are the essential factors of conscious and unconscious phenomena is held by writers like Ribot, Pierce, Jastrow and King. There is no doubt which view will appeal to scientists as leading to a greater extension of human knowledge.

VIRGINIA BAKER.

L'idée initiale de la philosophie de Descartes. A. ESPINAS. Rev. de Mét., XXIV, 3, pp. 253–278.

Descartes's first studies, after leaving *La Flèche*, were mathematical. He seems to have been led into philosophy by reading a treatise by St. Augustine, *De Utilitate credendi*. He brought to philosophy, as a result of these early studies, a mathematical ideal. The methodic doubt which he employed was not directed primarily to political or religious matters, but rather to physics and cosmology. The school taught the physics of Aristotle, and an attack upon Aristotelian physics was an attack upon the social order. This is why his reformation of physics was a serious matter. The doctrine of the automatism of the animals was an early product of his new method. It came to him when he discovered the application of algebra to geometry and of mathematics to physics; it was a part of his doctrine of mechanism, which opposed bare extension to pure thought. The Aristotelian doctrine that animals have sensitive souls offered difficulties in connection with the doctrine of immortality. Descartes's theory was consonant with Christian spiritualism which demanded that the doctrine of divine personality and human liberty take the place of the pantheistic hylozoism of the Greeks. It simplified cosmology, on the one hand, and made the human soul, on the other hand, absolutely distinct from the body, connected with it only by a passing tie. Pascal is said by Baillet to have admired the doctrine of animal automatism more than any other part of the Cartesian system. In the *Regulae* Descartes laid down the method which was to guide him. He there remarks that only mathematical knowledge is certain; this is because of the simplicity of its objects and the order in which they can be arranged. If we could follow such a method, proceeding from the simple to the complex, and avoiding all judgment on matters not so deduced, we would avoid all error and there is no truth to which we could not attain. Since order and measure may be attributed to all things one can conceive a universal mathematics. This identification of mathematical and philosophical method rests upon a metaphysical dogma. This dogma is the doctrine of simple natures, or essences, innate truths, pure forms grasped by intuition, out of which all complex natures are constituted. The

forms which objects imprint upon sense are either simple or complex, and it is possible for thought to reduce the complex forms to the simple forms. Those who hold that Descartes's doctrine of limiting our efforts to what is within our power foreshadows Kantian 'criticism' are mistaken; Descartes was objecting to magic, astrology, and alchemy. Descartes believed that he was directly dealing with the absolute when he enumerated in the *Regulae* the avenues and stages which lead to the absolute through the simple natures.

W. CURTIS SWABEY.

Principes fondamentaux pour la sociologie mécanique. A. PORTUONDO. Rev. Ph., XLII, 3, pp. 219–244.

This article is an attempt to apply the laws of mechanics to social phenomena. It is the first chapter of a book, *Apuntes de Mecánica Social*, published at Madrid. In social mechanics we regard society simply as a system of individuals and collections of individuals upon whom are exercised psychic forces. In this study we select one particular social situation which we abstract from all related situations, and treat singly. There is at a given moment in each individual an *ensemble* of ideas, feelings, and habits of willing. In every social group there is a like *ensemble*. The 'position' of an individual or of a group in a given situation at a given moment is the *ensemble*, in the individual or in the group, of all the psychic phenomena relating to the situation. The social 'position' of an individual can be symbolized by a point in space; the 'position' of a group by a system of points. When the 'position' of an individual changes, there is a certain movement in a certain direction. The movement of a group is the totality of the movements within the group. Social statics is the study of the case in which social forces balance each other and there is no change. Social dynamics is the study of the case in which a change is produced. Just as we can in mechanics theoretically predict movements if we have a knowledge of the initial state and of all the forces concerned, so in a completed social mechanics we could predict changes if we possessed a knowledge of the initial state and of the forces concerned. Mechanics is based upon the law of inertia. Every body tends to continue its present state of rest or its present state of movement uniformly in a straight line. If there is a change from this state of rest or uniform movement, we infer the existence of some external force. Let us apply this idea to social mechanics. For the sake of simplicity we shall consider an individual who is in a state of repose in regard to a certain situation. If the 'position' of this individual in this particular situation subsequently changes, we infer the existence of some psychic force acting upon the individual. The individual is the point of application of the force. With the ultimate nature of this process we are not concerned. In mechanics there is an equality of action and reaction. In such a case the masses are in an inverse ratio to the ratio of the accelerations. $m/m' = v'/v$. Likewise in social mechanics when an individual is acted upon by another individual or by a group, the first individual reacts with an equal intensity in the opposite direction. The masses of the elements concerned are in an

inverse ratio to the ratio of the changes effected. In social mechanics we are not concerned with the character of the actions, but only with the directions and intensities of forces and with their points of application. Everything to which the individual pays attention is an effective psychic force. The force must be adapted to the social element effected. The intensity of the force depends largely upon the state of this social element.

MELVIN RIGG.

The Meaning of the "Universe." (I) CHARLES E. HOOPER. Mind, N.S., XXVI, 102, pp. 129–145.

There is no absurdity in seeking a definition of the universe; for the idea is commonly and confidently used. As a preliminary definition one may take "the whole reality to which our thoughts have partial access." By universe we mean a totality of real thought-objects, considered under four aspects: Space, Time, as possessing Natural Characters, and as under Natural Causation. Space and time, taken in the concrete non-mathematical sense, are real aspects of the objective world. Everything, including Kantian noumena and the Spencerian Unknowable, is a thought-object. Reality means having a place in space and time. Its opposite is mental figment, not appearance, for what is real may appear. There are, therefore, no degrees of reality, although there are degrees of truth. A more formal definition of the universe would be 'a real and self-sufficient thought-object, which contains all other real thought-objects, both self-significant and symbolic.' Our earlier definition used the idea of aspects. Different aspects in physical things are founded not only in differences of view-point, but also in differences in the object; thus a sphere of uniform surface, texture, and color would be the same from any view-point. This notion of aspect can be applied to the universe itself.

W. CURTIS SWABEY.

NOTES.

We give below a list of articles in current philosophical magazines:

MIND, N. S., XXVI, 103: *J. B. Baillie*, On the Nature of Memory-Knowledge; *C. E. Hooper*, The Meaning of "The Universe" (II); *W. M. Thorburn*, What is a Person?; *J. C. Wordsworth*, Time as Succession; *S. Radhakrishnan*, Is Bergson's Philosophy Monistic?.

PSYCHOLOGICAL REVIEW, XXIV, 5: *John B. Watson*, An Attempted Formulation of the Scope of Behavior Psychology; *A. P. Weiss*, Relation between Functional and Behavior Psychology; *Harvey Carr*, The Relation between Emotion and its Expression; *H. G. Kenagy*, The Theory of the Social Forces; *Daniel Starch* and *I. E. Ash*, The Mental Work Curve; *Robert A. Cummins*, Individual Differences in a Normal School Class.

THE JOURNAL OF PHILOSOPHY, PSYCHOLOGY, AND SCIENTIFIC METHODS, XIV, 17: *F. C. S. Schiller*, Mr. Bradley, Bain, and Pragmatism; *C. E. Ferree* and *Gertrude Rand*, A Note on the Needs and Uses of Energy Measurements for Work in Psychological Optics; *Elsie Clews Parsons*, The Teleological Delusion.

XIV, 18: *Alfred H. Lloyd*, Pragmatism and Metaphysics; *Stephen C. Pepper*, The Nature of Scientific Matter; *John Dewey*, Duality and Dualism.

XIV, 19: *Wendell T. Bush*, Constructive Intelligence; *M. T. McClure*, Francis Bacon and the Modern Spirit.

XIV, 20: *Henry Nelson Wieman*, A Criticism of Coordination as Criterion of Moral Value; *Herman K. Haeberlin*, The Concept of the Unconscious; *Benjamin W. Van Riper*, Philosophy and Edification.

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XLII, 9: *A. Lynch*, L'évolution dans ses rapports avec l'éthique; *A. Leclère*, Les attitudes mentales et la mémoire (II).

REVUE DE MÉTAPHYSIQUE ET DE MORALE, XXIV, 4: *V. Delbos*, De la méthode en histoire de la philosophie; *H. Delacroix*, Stendhal et l'idéologie; *L. Selme*, Dynamique généralisée et dégradation de l'énergie.

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